

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT RELOCATION OF ARMY MATERIEL COMMAND AND CO-LOCATED ACTIVITIES TO FORT BELVOIR, VIRGINIA



**Department of the Army
U.S. Army Garrison Fort Belvoir, Virginia**

May 2002

Prepared for
Department of the Army
US Army Garrison Fort Belvoir

in accordance with
Army Regulation 200-2

pursuant to
National Environmental
Policy Act Section 102(2)(C)



Supplemental Environmental Assessment

Relocation of Army Materiel Command and Co-Located Activities

to

Fort Belvoir, Virginia

May 2002

Abstract

This Supplemental Environmental Assessment (EA) identifies and evaluates the potential effects of temporarily relocating approximately 1,170 civilian, military, and contractor personnel of the US Army Materiel Command (AMC) Headquarters and co-located activities from their current facility in Alexandria, Virginia, to Fort Belvoir, Virginia. A maximum of five temporary modular buildings and four parking lots would be constructed on the South Post of Fort Belvoir. The actual number, size and configuration of the modular buildings and parking lots would depend on the outcome of several organizational changes that may reduce the number of personnel relocated and may reduce the number of modular buildings. Headquarters AMC would stage the relocation in four to five phases between December 2002 and May 2003. Headquarters AMC personnel would occupy these temporary facilities until a location, either on Fort Belvoir or other site is found where AMC could be accommodated permanently. The purpose and need for the proposed action is to reduce or minimize the force protection vulnerability of Headquarters AMC and co-located activities by moving all staff to more secure facilities. In addition to the proposed action, a No Action Alternative and an alternative site for the modular buildings on Fort Belvoir's North Post were considered. No significant adverse impacts are anticipated as a result of the proposed action.

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**SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT**

US ARMY GARRISON FORT BELVOIR

**RELOCATION OF ARMY MATERIEL COMMAND
AND CO-LOCATED ACTIVITIES
TO
FORT BELVOIR, VIRGINIA**

MAY 2002

Reviewed by:



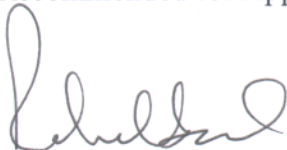
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Finding of No Significant Impact

U.S. Army Garrison Fort Belvoir
Directorate of Installation Support
Supplemental Environmental Assessment
Relocation of Army Materiel Command and Co-Located Activities to
Fort Belvoir, Virginia

1.0 Name of Action: Relocation of the Army Materiel Command (AMC) and Co-Located activities to Fort Belvoir, Virginia (Supplemental Environmental Assessment [EA]).

2.0 Description of Proposed Action: Under the proposed action, approximately 1,170 civilian, military, and contractor personnel of Headquarters, US Army Materiel Command (AMC) and co-located activities, currently occupying a leased building in Alexandria, VA, would relocate into temporary modular buildings on Fort Belvoir in 2002 and 2003. A May 2001 EA of the same name proposed moving headquarters AMC personnel to Fort Belvoir in three phases to increase their security. The first relocation phase began in 2001 with AMC personnel moving into existing buildings in Fort Belvoir's 200 and 1400 areas. The second two phases have not been implemented. In light of heightened security concerns in the wake of the September 11 terrorist attacks, AMC has revised their relocation schedule and plans to move into temporary buildings as quickly as possible. If a permanent building(s) were to be built in the future for headquarters AMC, the impacts of this action would be addressed in further environmental documentation.

3.0 Project Alternatives: The No Action Alternative and a North Post Alternative were evaluated. The impacts of the North Post Alternative were similar to those for the Proposed Action Alternative.

4.0 Environmental Consequences: The Environmental Assessment (EA) identified potential impacts of the proposed action and mitigation measures to reduce effects on human health and the environment. The evaluation is summarized below:

- **Land Use:** The proposed action would have no effect on existing land use patterns because adjoining land uses are administrative and this use of the proposed site agrees with the Fort Belvoir master plan.
- **Demographics and Housing:** The proposed action would have little impact on demographics, community facilities, housing, or taxes and other revenues. Few personnel are expected to relocate their residences since AMC personnel already live in the same areas as Fort Belvoir personnel.
- **Transportation & Traffic:** The proposed action would reduce the number of vehicle miles traveled by AMC personnel commuting to work by 2.4 percent, primarily because 37 percent of AMC personnel now drive by Fort Belvoir, principally along the I-95 and Route 1 corridors, to get to work. Traffic studies indicate that three of the intersections studied would experience degradation in

levels of service of more than five percent as a result of the proposed action. The adverse impacts are due primarily to the high volume of vehicles on Fort Belvoir waiting to exit during the evening period. Traffic mitigation would be implemented to reduce on-post delays among vehicles leaving Fort Belvoir. AMC commuters' use of public transit would decline under the proposed action because Fort Belvoir is less accessible by transit than their current location. The resulting increase in vehicle trips would largely be offset by the projected decrease in vehicle miles traveled by all AMC personnel. Fort Belvoir is undertaking a study of transit needs in order to address this lack of accessibility.

- **Air Quality and Noise:** The proposed action would have no significant impact on air quality in the region or noise levels and air quality in the locality of Fort Belvoir.
- **Natural Resources:** The proposed action would disturb about 21 relatively flat acres of land now covered with mowed grass, a grass-shrub strip, a three-acre woodlot, and scattered landscape trees remaining from earlier development. The trees cut down would be replaced at a two-to-one ratio, on site, if possible, in bioretention areas and drainageway buffers. No wetlands, floodplains, threatened or endangered species, Chesapeake Bay protection areas, or sensitive natural areas would be affected. The design of the development would utilize a low-impact development (LID) approach to manage stormwater. The amount of impervious surface would increase by approximately 10.9 acres. Soil and erosion control best management practices would be used during construction and after to minimize runoff and reduce the amount of sediment entering local streams.

5.0 Conclusions: On reviewing the environmental assessment and other project information, the Commander of the U.S. Army Garrison Fort Belvoir has concluded that the effects of the proposed action, as mitigated, are not significant and will not adversely affect the quality of the environment. Fort Belvoir will ensure that the necessary mitigation measures are implemented. An Environmental Impact Statement will not be prepared.

Notice of Availability: The Environmental Assessment is available for public review at the Directorate of Installation Support, Fort Belvoir, Virginia and at John Marshall, Lorton, and Sherwood Hall branches of the Fairfax County Public Libraries. A copy of this notice and the Environmental Assessment can be viewed on the World Wide Web at www.belvoir.army.mil.

Interested parties are invited to submit written comments for consideration on or before 30 days after publication of this notice to **Commander, U.S. Army Garrison Fort Belvoir, 9430 Jackson Loop, Suite 107, ATTN: ANFB-ELE, Fort Belvoir, VA 22060-5130**. E-mail comments will be accepted at environmental@belvoir.army.mil. The proposed action will not be implemented before this date. For more information, contact Mr. Patrick M. McLaughlin at (703) 806-4007.

EXECUTIVE SUMMARY

S.1 Introduction

The US Army Garrison Fort Belvoir, VA is proposing to accommodate the temporary relocation to Fort Belvoir of the approximately 1,170 civilian, military, and contractor personnel of Headquarters, US Army Materiel Command (AMC) and co-located activities, currently occupying a leased building in Alexandria, VA.

The May 2001 environmental assessment (EA), *Environmental Assessment, Relocation of Army Materiel Command and Co-Located Activities to Fort Belvoir, Virginia* (US Army Garrison Fort Belvoir, May 2001), evaluated the proposed relocation of approximately 1,600 Headquarters AMC and co-located activities personnel from the leased facility in Alexandria to facilities on Fort Belvoir. The relocation was to be implemented in three phases. Phase 1 involved the relocation of approximately 300 personnel into the 1400 area and the 200 area. This phase began in 2001 and will be complete in August 2002. Phases 2 and 3, which would have involved relocating the remaining personnel to existing or newly constructed facilities on Fort Belvoir, have not been implemented.

Since the initiation of Phase 1 of the relocation, and in light of heightened security concerns in the wake of the September 11th terrorist attacks, AMC has revised the latter part of the original relocation plan. Under the revised AMC plan, all Headquarters AMC staff and co-located activities personnel that were to move during Phase 2 and Phase 3 would move onto Fort Belvoir in 2002 and 2003 into temporary modular buildings. Those Headquarters AMC and co-located activities personnel who AMC proposes to relocate to Fort Belvoir hereafter are referred to as Headquarters AMC personnel. Headquarters AMC personnel would occupy these temporary facilities for approximately five to ten years until a location is found where they could be accommodated permanently.

This supplemental EA evaluates the impacts of the proposed temporary relocation of Headquarters AMC personnel into modular buildings on Fort Belvoir. It has been prepared pursuant to NEPA, the Council on Environmental Quality (CEQ) regulations in 40 Code of Federal Regulations (CFR) Part 1500-1508, and Army Regulation (AR) 200-2, "Environmental Effects of Army Actions" at 32 CFR Part 651.

S.2 Purpose and Need for the Proposed Action

The purpose and need for the proposed relocation is to reduce or minimize the force protection vulnerability of the Headquarters AMC by relocating the staff to more secure facilities. AMC, a four star command, is the Army's global provider of materiel readiness – technology, acquisition, materiel development, logistics power projection, and sustainment – across the

spectrum of military operations. Its highly sensitive mission creates a potentially inviting target for terrorist organizations.

An analysis of the AMC facility in Alexandria concluded that long-term physical security and force protection needs cannot be met at the current building. The current leased space building is considered vulnerable because there is limited space around the facility, resulting in insufficient stand-off distance between public roads and the building. In addition, because the building is leased, AMC does not have the ability to fully control or influence the use of the space around it. The sites to which AMC would relocate on Fort Belvoir under the proposed action would meet AMC's security needs.

The immediate need for a secure location is driving the proposal for the relocation of Headquarters AMC to Fort Belvoir. The terrorist actions of September 11, 2001 underscored the need to move personnel to secure facilities as soon as feasible. AMC determined that this could be achieved by relocating Headquarters AMC personnel to temporary buildings on Fort Belvoir between December 2002 and May 2003.

S.3 Alternatives to the Proposed Action

This EA considers three courses of action: no action, North Post Alternative, and the Proposed Action. Under the No Action Alternative, transfers of personnel would not take place. AMC would remain in leased space, either at the facility in Alexandria or in other leased space. AMC's security and force protection needs would remain unmet. Although not deemed a reasonable option, the No Action Alternative is considered in this EA because it provides baseline conditions against which the impacts of the proposed action can be assessed.

In addition to the Proposed Action and No Action Alternatives, AMC considered the North Post Alternative. Under this alternative, as under the Proposed Action, the approximately 1,170 Headquarters AMC personnel would be relocated temporarily from the Alexandria facility to Fort Belvoir. These personnel would move into newly constructed, temporary modular buildings in the 1900 area relocation site on the North Post. Personnel would move in multiple phases between December 2002 and May 2003, and would occupy these temporary facilities until a location is found where they could be accommodated permanently. The North Post Alternative is considered in this EA.

In addition to the Proposed Action, No Action, and North Post Alternatives, AMC considered alternative scenarios to meet their force protection objective: relocate to other military installations in the National Capital Region, and utilize alternative, non-contiguous sites on Fort Belvoir for the relocation of Headquarters AMC. With respect to other installations in the National Capital Region, Fort Belvoir was selected because: it is close to organizations with which AMC interfaces, such as the Defense Logistics Agency (located on Fort Belvoir); its location would minimize the change in commuting distances for AMC personnel; and it has a

secure site with capacity to accept personnel. A review of available existing leased space found none that would meet AMC's security requirements. In regard to alternative sites on Fort Belvoir, none were found to be feasible (i.e., land use conflicts, logistical constraints, and presence of protected species).

S.4 Environmental Consequences

The impacts of implementing either the Proposed Action or the North Post Alternatives would be similar. The areas that would be used to erect temporary modular buildings and parking lots in both cases have been used for buildings in the past. Most of the old buildings have been demolished. Trees and grass once planted to landscape the areas remain.

Implementation of the Proposed Action or the North Post Alternative would have no significant adverse impacts on: air quality, noise levels, infrastructure, cultural resources, floodplains, wetlands, Chesapeake Bay Resource Protection Areas, threatened or endangered species, or hazardous substances. The proposed use of either the 1400 area or 1900 area would be consistent with Fort Belvoir's master plan, which specifies administrative uses for these areas. In particular, use of the 1400 area is in line with the master plan expectation of increased administrative use for the northern portion of the South Post Planning District. The project would be consistent to the maximum extent practicable with enforceable policies of the Commonwealth of Virginia's Coastal Resources Management Plan.

Because Fort Belvoir is located approximately eleven miles (18 km) south of AMC's current facility, and AMC's personnel already live in the same areas of the region as people who work at Fort Belvoir (based on review of home zip code data), very few, if any, AMC employees are anticipated to move their residences as a result of the proposed relocation. Therefore, there would be no significant impact on socioeconomic factors and no significant increase in the demand for community facilities and services.

Because 37 percent of AMC's personnel live south of Fort Belvoir and essentially drive by it, principally along the I-95 and Route 1 corridors, to go north to AMC's current building in Alexandria, the daily total vehicle miles traveled by AMC personnel would actually decrease by 2.4 percent following relocation to Fort Belvoir. An analysis of the projected levels of service for the eight intersections most likely to be affected by an increase in personnel at Fort Belvoir indicated that three intersections would be over capacity for the Proposed Action. The following measures would be taken to mitigate the traffic impacts of the AMC relocation to Fort Belvoir:

- Fairfax County Parkway and Kingman Road – Open Beulah Street south of Telegraph Road to post traffic only.
- US Route 1 and Backlick Road/Pohick Road – Open Lieber Gate to right turn traffic (US Route 1 southbound) during the evening peak period.

- Belvoir Road and 9th Street – Open the ramp from Gunston Road to northbound Route 1 during the evening peak period.

Fort Belvoir is less accessible by public transportation than AMC's Alexandria site, which is located about one-half mile from the Van Dorn Metrorail Station. Approximately 10 percent of AMC personnel now use transit to commute. It is expected that significantly fewer AMC commuters would use public transit if working at Fort Belvoir. To encourage the use of high-occupancy vehicles, a Transportation Management Plan prepared for this proposed action recommends: placing bus stops close to buildings; completing the Fort Belvoir Mass Transit Study during the current calendar year; continuing and promoting the use of the Fort Belvoir Transportation Coordination Office, flexible and compressed work schedules, telecommuting, and the transit discount program; and establishing a personalized rideshare matching service.

The Proposed Action Alternative would disturb about 21 acres (8 hectares) of ground, now partly covered with old parking lots and one building, but mostly covered with turf grasses dotted with landscape trees, grassy areas, a grass-shrub strip, and a three-acre (one-hectare) woodlot. The amount of impermeable surface covered by buildings, parking lots, and sidewalks would increase by approximately 10.9 acres (4.4 hectares). Mature landscape trees, mostly willow oaks, in old landscaped areas as well as shrubs, vines, and trees in the three-acre (one-hectare) woodlot would be cut down, reducing wildlife habitat and food sources. Although most of the area has a mowed grass understory and offers little protection, trees, the grass-shrub strip and the woodlot are used by wildlife, and, in particular, the edges between these cover types are beneficial to a variety of wildlife. Species most likely to be affected include birds common to Fort Belvoir, and terrestrial species that roam into open park-like areas, including white-tailed deer, woodchucks, raccoons, rabbits, foxes, and opossums.

There would be no effect to children as analyzed under Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, nor would the project discriminate against any group because of their race, color, national origin or economic circumstances under Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*.

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1 PURPOSE AND NEED

The US Army Garrison Fort Belvoir is proposing to accommodate the temporary relocation to Fort Belvoir of civilian, military, and contractor personnel of the US Army Materiel Command (AMC) Headquarters and co-located activities. Fort Belvoir is located in southeastern Fairfax County, Virginia, about 18 miles (mi) (29 kilometers [km]) south of Washington, DC, on the Potomac River ([Figure 1-1](#), Location of Fort Belvoir, and [Figure 1-2](#), Fort Belvoir).

Since 1973, Headquarters AMC has occupied a leased building in Alexandria, Virginia. This facility has been identified as posing a security risk to agency personnel. The purpose and need for the proposed relocation is to reduce or minimize the force protection vulnerability of Headquarters AMC by moving the staff to more secure facilities.

The May 2001 environmental assessment (EA), *Environmental Assessment, Relocation of Army Materiel Command and Co-Located Activities to Fort Belvoir, Virginia* (US Army Garrison Fort Belvoir, May 2001), evaluated the proposed relocation of approximately 1,600 Headquarters AMC and co-located activities personnel from the leased facility in Alexandria to facilities on Fort Belvoir. The relocation was to be implemented in three phases. Phase 1 involved the relocation of approximately 300 personnel into the 1400 area and the 200 area. This phase began in 2001 when approximately 150 co-located personnel moved from Alexandria into existing office space on Fort Belvoir's South Post 200 area. Phase 1 will be complete when approximately 80 Headquarters AMC personnel relocate into existing, vacant office space in Building 1464 this August 2002. During Phase 2, approximately 700 personnel would relocate to the existing McNamara Headquarters Complex (HQC) on the North Post of Fort Belvoir. In Phase 3, another 600 Headquarters AMC and co-located activities personnel would move into new construction or into existing space on Fort Belvoir, if any becomes available. Phases 2 and 3 have not been implemented.

Since the initiation of Phase 1 of the relocation, and in light of heightened security concerns in the wake of the September 11th terrorist attacks, AMC has revised the latter part of the original relocation plan. Under the revised AMC plan, all Headquarters AMC staff and co-located activities personnel that were to move during Phase 2 and Phase 3 would move onto Fort Belvoir in 2002 and 2003 into temporary modular buildings. Those Headquarters AMC and co-located activities personnel who AMC proposes to relocate to Fort Belvoir hereafter are referred to as Headquarters AMC personnel. Headquarters AMC personnel would occupy these temporary facilities for approximately 5 to 10 years until a location is found where they could be accommodated permanently.

Based on a legal opinion from the AMC Office of Command Counsel and in consultation with the Office of the Commander, Military District of Washington and the Fort Belvoir engineering office, a Record of Environmental Consideration (REC) applies to the proposed relocation of the Command Group into Building 1464. The REC is based on the May 2001 EA, which analyzes

the proposed relocation of 1,600 Headquarters AMC civilian, military, and contractor personnel into areas on Fort Belvoir, including the 1400 area where Building 1464 is located. Since the proposed relocation of approximately 80 personnel of the Command Group plus the previous move of 150 co-located personnel is smaller in scope than the 300-personnel Phase 1 relocation described in the May 2001 EA, the factors that would have triggered additional environmental analysis do not pertain to the movement of the Command Group into Building 1464 and no additional analysis pursuant to the National Environmental Policy Act (NEPA) of 1969 is required to support this action. This conclusion is predicated upon the understanding that the proposed relocation of the Command Group will occur with or without the subsequent movement of the remainder of the HQ AMC personnel.

This supplemental EA evaluates the impacts of the proposed temporary relocation of Headquarters AMC personnel into modular buildings on Fort Belvoir. It has been prepared pursuant to NEPA, the Council on Environmental Quality (CEQ) regulations in 40 Code of Federal Regulations (CFR) Part 1500-1508, and Army Regulation (AR) 200-2, "Environmental Effects of Army Actions" at 32 CFR Part 651.

1.1 AMC: Mission and Background

AMC was established in August 1962. AMC accomplishes its mission through the following eight major subordinate commands:

- Aviation and Missile Command.
- Army Research Laboratory.
- Communications-Electronics Command.
- Operations Support Command.
- Soldier and Biological Chemical Command.
- Simulation, Training and Instrumentation Command.
- Tank-automotive and Armaments Command.
- Security Assistance Command.

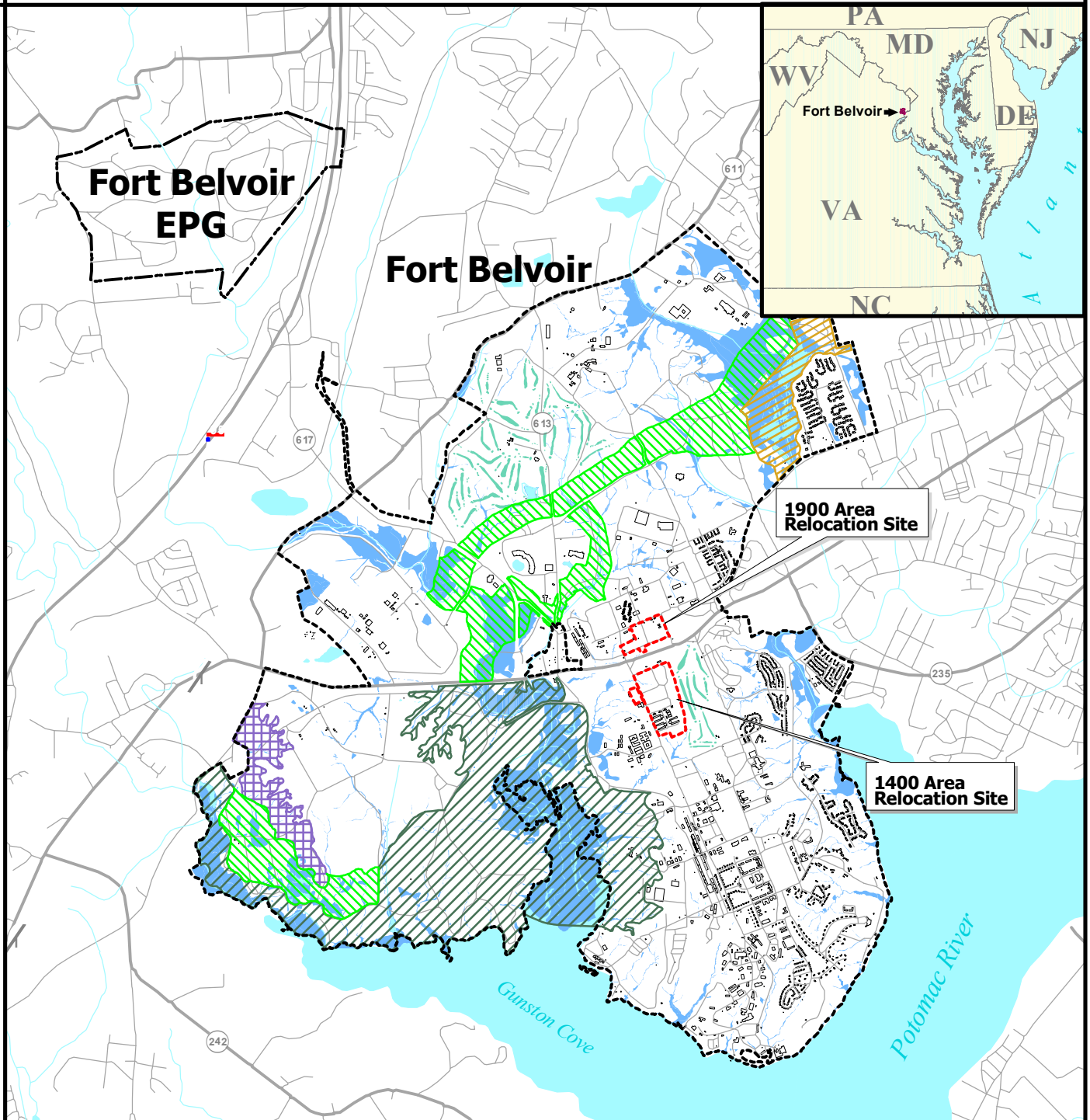
The major subordinate commands direct the activities of numerous depots, arsenals, ammunition plants, laboratories, and procurement operations. Staffing these organizations are about 58,000 employees, both military and civilian, many with highly developed specialties in weapons development and logistics. AMC occupies about 285 locations worldwide, covering more than 40 states and 24 countries.

AMC is the Army's global provider of materiel readiness – technology, acquisition, materiel development, logistics power projection, and sustainment – across the spectrum of military operations. AMC's mission is complex and ranges from the development of sophisticated

Location of Fort Belvoir



Fort Belvoir



-  Wildlife Refuge
-  Jackson Miles Abbott Wetland Refuge
-  Forest and Wildlife Corridor
-  Accotink Bay Wildlife Refuge
-  Golf Course
-  Wetland
-  Waterbody
-  AMC Potential Relocation Area

4000 0 4000 8000 Feet
 1000 0 1000 2000 Meters



-  Fort Belvoir Main Post Boundary
-  Fort Belvoir Engineer Proving Ground



Figure 1-2

weapons systems, to advanced research in such areas as lasers, to the maintenance and distribution of spare parts. It manages inventory accounts worth over \$7 billion. To develop, buy, and maintain materiel for the Army, AMC works closely with industry, colleges and universities, the sister services, and other government agencies to ensure optimal state-of-the-art technology and support for the defense of the nation.

AMC also handles diverse missions that have far-reaching impact beyond the Army. For example, AMC acquires the ammunition for all the US military services, manages the multi-billion dollar business of selling Army equipment and services to friends and allies of the US, and negotiates and implements agreements for co-production of US weapons systems by foreign nations. AMC also provides numerous acquisition and logistics services to the other components within the Department of Defense (DoD) and to many other government agencies.

In recent years, AMC has participated in many humanitarian and disaster relief efforts both at home and abroad. Besides providing equipment and supplies, AMC has established and managed distribution centers in affected areas to expedite getting badly needed supplies to victims.

The mission of Headquarters AMC is to provide broad policy and basic guidance, accomplish major planning, establish and coordinate major programs, evaluate AMC programs and operations, allocate resources for mission accomplishment, assist major subordinate commands in the accomplishment of their mission, and resolve command-level problems.

1.2 Security Considerations

Headquarters AMC, as a four star command with senior Army personnel and a highly sensitive mission that includes foreign military sales, creates a potentially inviting target for terrorist organizations. An analysis of the AMC facility in Alexandria concluded that long-term physical security and force protection needs cannot be met at the current building. The current leased space building is considered vulnerable because there is limited space around the facility, resulting in insufficient stand-off distance between public roads and the building. Greater stand-off distance, if there were sufficient space, would provide protection from the detonation of explosives and other hostile actions.

In addition, the building is located in a densely developed, urban corridor and, because the building is leased, AMC does not have the ability to control or influence the use of the space around it. The building stands in close proximity to over 3,600 housing units, a major roadway with ready access to interstate highways and public transportation rail lines, and rail-to-truck trans-loading operations. On all sides, the building is within a highly lethal blast radius for an explosive comparable to that used in the 1995 Murrah Building bombing in Oklahoma City.

The immediate need for a secure location is driving the proposal for the relocation of Headquarters AMC to Fort Belvoir. The terrorist actions of September 11, 2001 underscored the

need to move personnel to secure facilities as soon as feasible. AMC determined that this could be achieved by relocating Headquarters AMC personnel to temporary buildings on Fort Belvoir as soon as reasonably possible.

Under Phase 2 of the relocation previously evaluated in the May 2001 EA, 700 AMC personnel were to move into the McNamara HQC on Fort Belvoir in Fiscal Years 2002 or 2003. However, this is no longer possible because the McNamara Building is now fully occupied and an addition is being built to house the Defense Threat Reduction Agency (an action documented in an EA dated September 2001 [US Army Garrison Fort Belvoir]).

Fort Belvoir is a secure, protected Army post. Although prior to September 11, 2001, all gates normally were open during the day and closed at night, since that date, some gates have been completely closed and all others are closed to vehicles not registered with Fort Belvoir. Only one gate, Tulley Gate, located near the intersection of US Route 1 and Pohick Road, is currently open to unregistered vehicles, and a pass must be obtained for entry. Under the condition of high alert, the post can be closed down completely to all but military personnel. In addition, both the 1400 area relocation site and the 1900 area relocation site (see Figure 1-2), which is proposed as an alternative location for the proposed temporary modular buildings, provide substantially greater stand-off distance than does the existing AMC facility in Alexandria. Both sites would meet the security needs of Headquarters AMC.

1.3 The NEPA Process

NEPA provides for the consideration of environmental issues in federal agency planning and decision-making. Under NEPA, federal agencies must prepare an environmental impact statement (EIS) or an EA for any federal action, except those actions that are determined to be “categorically excluded.” An EIS is prepared for those federal actions that may significantly affect the quality of the human environment. An EA is a concise public document that serves to provide sufficient evidence and analysis for determining whether to prepare an EIS. The EA includes brief discussions of the following:

- The need for the proposal.
- The alternatives (as required under Section 102 [2] [E] of NEPA).
- The environmental impacts of the Proposed Action and alternatives.
- A listing of agencies and persons consulted.

The EA results in either a Finding of No Significant Impact (FNSI) or a decision to prepare an EIS. If Fort Belvoir determines that the Proposed Action may have a significant impact on the quality of the human environment, then an EIS will be prepared.

2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the alternatives considered in this supplemental EA:

- **No Action Alternative** – Personnel with Headquarters AMC would remain in their current leased facility in Alexandria, Virginia.
- **Proposed Action** – Approximately 1,170 personnel from Headquarters AMC would relocate temporarily from leased space in Alexandria, Virginia, to modular buildings in the 1400 area on Fort Belvoir.
- **North Post Alternative** – The 1,170 Headquarters AMC personnel would relocate temporarily to modular buildings in the 1900 area.

The alternatives are described in [subchapters 2.1](#) through [2.3](#), respectively. AMC also considered other options but found them to be unfeasible. [Subchapter 2.4](#) briefly explains why Fort Belvoir was selected to be the proposed relocation site, and describes alternative sites on Fort Belvoir that initially were considered but subsequently were eliminated from further consideration.

2.1 No Action Alternative

Under the No Action Alternative, transfers of personnel would not take place. The approximately 1,170 civilian, military, and contractor personnel currently working in leased space in Alexandria would continue to do so.

The existing Headquarters AMC facility is located in Alexandria, Virginia, on a main public road, with ready access to interstate highways and public transportation. The setback between the facility and the public road is inadequate to provide protection from potential detonation of explosives and other hostile actions. Analysis of the facility concluded that long-term physical security and force protection needs cannot be met there. Continued occupancy of the facility is an option only for the near term. For security reasons, Headquarters AMC eventually must relocate.

Although this alternative does not meet the objective of lessening or minimizing the force protection vulnerability of Headquarters AMC, its impacts are nonetheless considered to provide baseline conditions against which to assess the impacts of the Proposed Action.

2.2 Proposed Action

Fort Belvoir consists of two areas separated by Interstate 95 (I-95): the Main Post and the Engineer Proving Grounds (EPG). The Main Post is bisected by US Route 1 and the area south of US Route 1 is referred to as the South Post, while the area north of US Route 1 is called the North Post (Figure 1-2). The Main Post encompasses 7,836 acres (ac) (3,171 hectares [ha]). The potential AMC temporary relocation areas are shown on Figure 2-1, AMC Potential Relocation Sites.

Fort Belvoir's History

Military use of the land forming Fort Belvoir began in 1915 with the US Army Corps of Engineers School's summer training exercises. In the 1950s, the emphasis at Fort Belvoir began shifting from engineer training to research and development. The 1988 relocation of the Army Engineer School to Fort Leonard Wood in Missouri completed the shift in function from engineer training to administrative and logistics support for defense agencies in the National Capital Region.

Currently, about 21,240 civilian and military personnel work on Fort Belvoir, which provides support services for over 200,000 military personnel, dependents, and retirees in the region. Under the Proposed Action, approximately 1,170 civilian, military, and contractor personnel of Headquarters AMC would be relocated temporarily from their current facility in Alexandria to Fort Belvoir.

The personnel would be moved into a maximum of five newly constructed, one-story temporary modular buildings in the 1400 area relocation site. The five modular buildings would provide a total of 275,000 gross square feet (sq ft) (27,548 gross square meters [sq m]) of space. Under the Proposed Action, four parking lots, with a total of 702 parking spaces, would be constructed adjacent to the modular buildings and nearby, on the west side of Gunston Road in the 1400 area.

The actual number, size and configuration of the modular buildings and parking lots would depend on the outcome of several organizational changes under consideration by both Headquarters AMC and the Department of the Army. These changes may reduce the number of personnel relocated below the cited 1,170 personnel maximum, and may reduce the number of modular buildings below the five building maximum.

Headquarters AMC would stage the relocation in four to five phases between December 2002 and May 2003. Headquarters AMC personnel would occupy these temporary facilities until a location, either on Fort Belvoir or other site is found where AMC could be accommodated permanently.

AMC Potential Relocation Sites

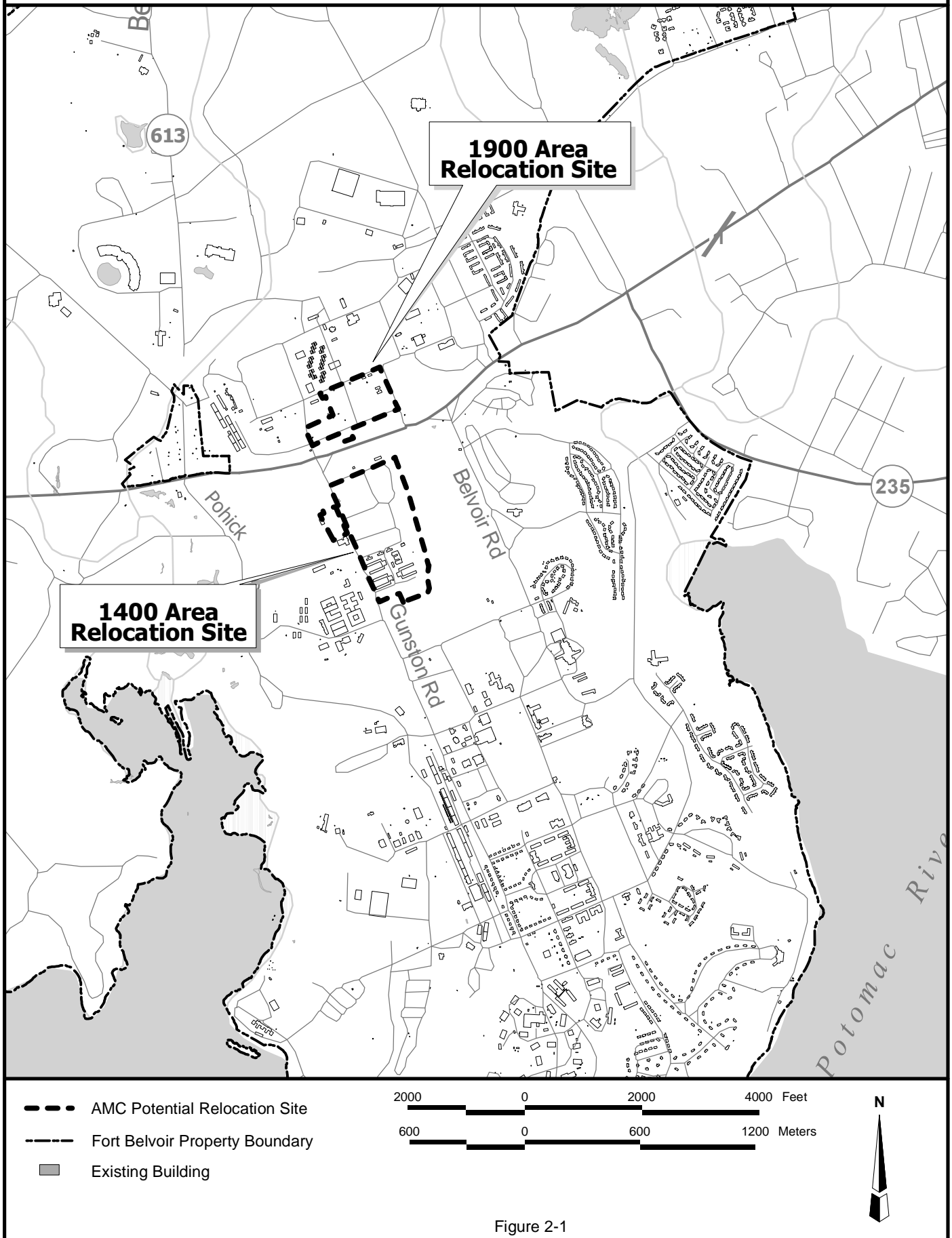


Figure 2-1

2.3 North Post Alternative

Under the North Post alternative, as under the Proposed Action, the approximately 1,170 Headquarters AMC personnel would be relocated temporarily from the Alexandria facility to Fort Belvoir. These personnel would move into newly constructed, temporary modular buildings in the 1900 area relocation site on the North Post. A maximum of four one-story and two two-story modular buildings would provide a total of 259,200 gross sq ft (24,080 gross sq m) of space, and two parking lots, constructed adjacent to the modular buildings, would provide 702 parking spaces. The actual number, size and configuration of the modular buildings and parking lots would depend on the outcome of the organizational changes currently under consideration.

Personnel would move in multiple phases between December 2002 and May 2003, and would occupy these temporary facilities until a location is found where they could be accommodated permanently.

2.4 Alternative Sites Considered

2.4.1 Alternative Sites in the National Capital Region

Headquarters AMC considered two alternative scenarios to meet their force protection objective: (1) relocate to a military installation with secure facilities in the National Capital Region (NCR), or (2) lease space in an existing facility that would offer more security than their present location. Based on analysis, reviews and coordination with the Washington Headquarters Services and the Force Protection Directorate, DoD determined that there were no existing facilities for lease in the NCR that would meet the security requirements of Headquarters AMC.

Because of the security needs of Headquarters AMC, the selection of a relocation site focused on military installations in the NCR, particularly ones that could provide a secure environment, could accommodate AMC's personnel, and were located where they would minimize disruption of personnel. Fort Belvoir was found to be the location best suited to the requirements of Headquarters AMC because:

- No other NCR facility had available space to accommodate 1,170 personnel and meet AMC's force protection requirements at one location.
- Fort Belvoir is close to organizations with which Headquarters AMC regularly interfaces, particularly the Defense Logistics Agency (DLA), located on Fort Belvoir, and the Pentagon.
- Fort Belvoir's location would minimize the change in commuting distances and the necessity for moving their residences for Headquarters AMC personnel now

based at the Alexandria facility when compared to relocation to other NCR military installations.

- AMC already has subordinate units located at Fort Belvoir.
-

2.4.2 Alternative Sites on Fort Belvoir

Two alternative, non-contiguous sites on Fort Belvoir were investigated as feasible locations for the relocation of Headquarters AMC. Under this alternative, approximately 75 personnel would move into an existing building in the Night Vision Laboratory area near the Potomac River on the South Post. The remaining Headquarters AMC personnel would move into temporary buildings to be built in the general area of Warren Road and 21 Street, several thousand feet northwest of the Night Vision Laboratory area, also on the South Post.

These sites were not selected for the following reasons:

- The proposed location of a 12-ac (5-ha) parking lot serving several of the temporary buildings would be in an area designated in the *Tompkins Basin Recreation Area Master Plan* (US Army Garrison Fort Belvoir, December 2000) for development of a recreational vehicle campsite. Construction of the parking lot would require clearing the park-like wooded site of mature trees, principally oaks, and would limit or preclude the planned future use the site.
 - One of the proposed temporary buildings would be constructed in the location of the existing installation firewood storage lot, requiring the removal and disposal of large quantities of tree stumps and trunks.
 - The Northern Virginia well amphipod (*Stygobromus phreaticus*), a Virginia species of concern, was found by the Virginia Department of Conservation and Recreation, Division of Natural Heritage from field surveys conducted in 1996 to occur in the ground water downslope of the proposed parking lot and temporary building sites (US Army Garrison Fort Belvoir, March 2001). Detailed investigations and mapping of the occurrence of this subterranean amphipod and designing a program to minimize stormwater runoff impacts to the species would have delayed the move and could have increased the cost of the project.
 - The five temporary buildings would have been separated from each other by ravines and spread out in such a way that to walk from one to the next would have been time consuming, limiting direct interactions.
-

3 AFFECTED ENVIRONMENT

The CEQ's regulations implementing NEPA (40 CFR Part 1500) require documentation succinctly describing the environment of the area(s) to be affected by the alternatives under consideration, as well as a discussion of the impacts in proportion to their significance. The affected environment for the Proposed Action ranges from specific sites on Fort Belvoir where personnel would relocate to the broader region, where socioeconomic, transportation, and air quality variables may be affected. The affected environment is described in Chapter 3 of the May 2001 EA.

3.1 Land Use, Plans, and Coastal Zone Management

3.1.1 Land Use

The land use on Fort Belvoir is described in Subchapter 3.1.1.1 of the May 2001 EA.

3.1.1.1 1400 Area Relocation Site

The 1400 area relocation site is on the South Post of Fort Belvoir, south of Route 1 and along Gunston Road (see [Figure 3-1](#), Existing Land Use). There are two subareas to which AMC might relocate. The first one is bounded by 1st Street to the north and Gunston Road to the west. Its eastern boundary runs approximately parallel to the jogging path along the west side of the South Post Golf Course, and it extends south to include the paved parking lots south of Buildings 1464 and 1465.

The southern portion of this subarea comprises several large buildings, two smaller buildings and large paved and unpaved parking areas. The large buildings originally were built as barracks that now house administrative entities such as the Criminal Investigation Command, the Program Executive Office of the Standard Army Management Information Systems, and the headquarters of the Communications Electronics Command Software Engineering Center. The South Post Health Clinic is there as well.

The northern portion of the subarea east of Gunston Road contains two empty buildings and a few unused, paved parking areas. Most of the area is undeveloped, comprising open fields and wooded areas.

The second subarea, across Gunston Road from the first one, is an open parcel, comprising paved parking areas and a large open field. This subarea lies north of Building 1462, the Kawamura Arts and Crafts Center, and east of Building 1457, which houses the Criminal Investigation – Fort Belvoir Resident Agency.

3.1.1.2 1900 Area Relocation Site

The 1900 area relocation site, on the North Post of Fort Belvoir, lies to the east of Gunston Road and south of Goethels Road, but excludes the motor pool area. It extends east to Constitution Road and South to Meade Road, also encompassing a paved parking area along the south side of Meade Road. Most of this area is an open parcel, comprising open fields and park-like areas with mature trees, although several empty buildings and unused paved and unpaved parking areas also are present.

3.1.2 Plans

3.1.2.1 Fort Belvoir

The *Fort Belvoir Real Property Master Plan, Long-Range Component* is discussed in Subchapter 3.1.2.1 of the May 2001 EA.

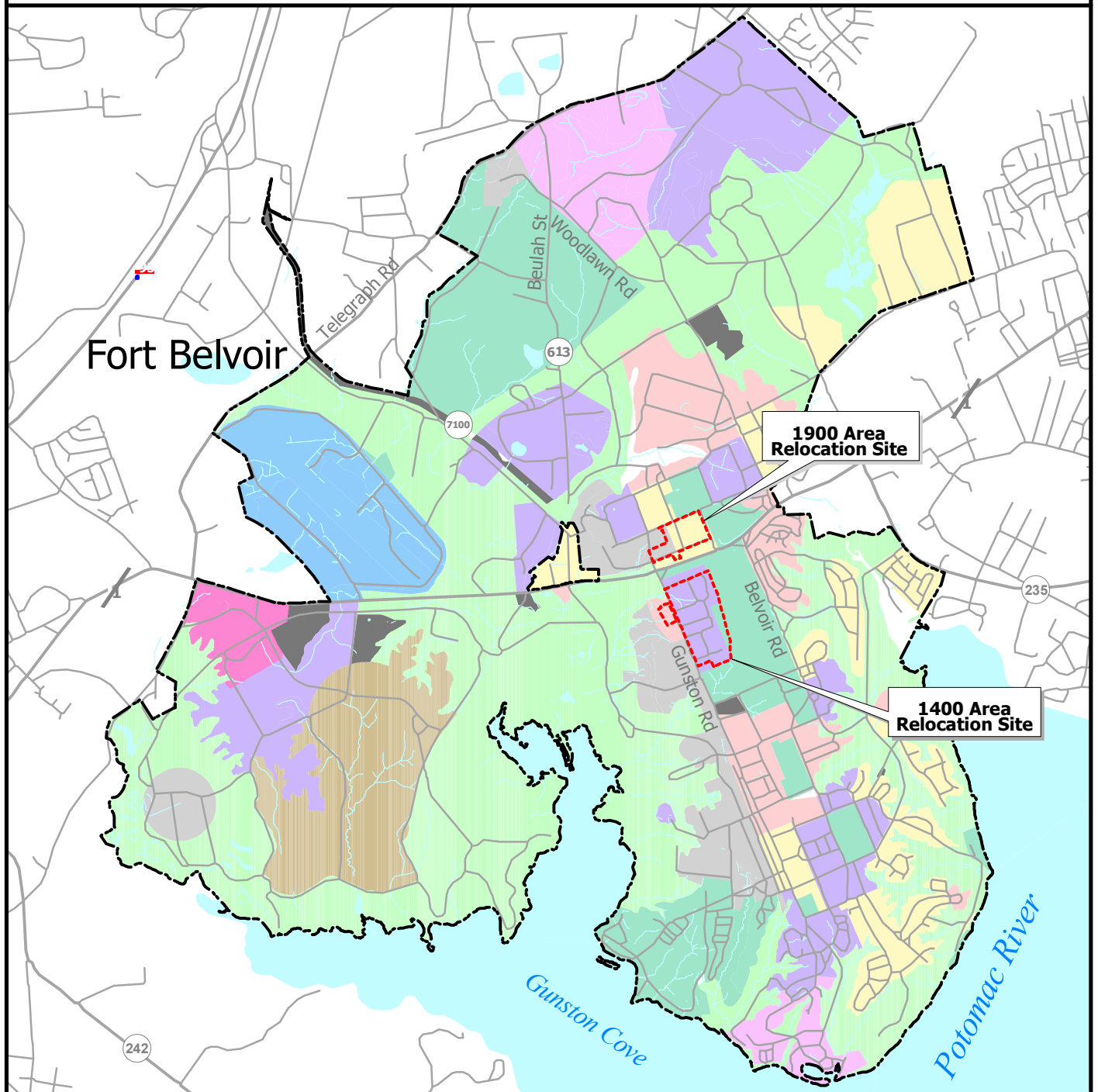
1400 Area Relocation Site

The 1400 area relocation site falls within the South Post Planning District, which contains areas devoted to research and development, education, post administration and support, supply/storage, medical services, troops and family housing, and recreational spaces. The plan foresaw a decrease in importance, and migration toward the south of the district, of research and development activities, freeing space in the northern half (where the 1400 area relocation site is located) for administrative uses. Both administrative and research areas were to be served by structured parking to preserve open space. At total build-out (TBO), the South Post Planning District was deemed capable of accommodating a working population of about 16,350 people and a total of about 2,900 residents.

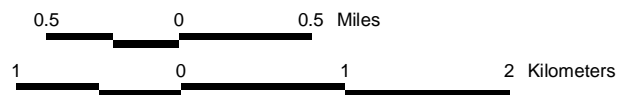
1900 Area Relocation Site

The 1900 area relocation site is located within the Lower North Post Planning District. Land uses in this district are primarily family and troop housing, administration, community facilities, supply/storage, education, and industry/maintenance. According to the plan, new construction in this planning district was limited to an average 25 percent lot coverage and a maximum building height of eight stories. The plan posited a maximum level of development capable of supporting a TBO working population of about 5,960 people, and a residential population of about 3,036. An expanded community facility area was shown around the existing commissary facility to serve a regional service area population. The plan also reserved an industrial area for future use as an antenna farm and included a proposed family housing area, a supply/storage area, and a public transportation node.

Existing Land Use



- Administration/Education
- Airfield
- Community Facility
- Environmentally Sensitive
- Industrial
- Medical
- Outdoor Recreation
- Research and Development
- Supply/Storage/Maintenance
- Training Range
- Troop Housing/Family Housing/Accotink Village



- AMC Potential Relocation Site
- Fort Belvoir Property Boundary



Figure 3-1

3.1.2.2 National Capital Planning Commission

The National Capital Planning Commission (NCPC) and the Comprehensive Plan for the National Capital (CPNC) are discussed in Subchapter 3.1.2.2 of the May 2001 EA.

3.1.3 Coastal Zone Management

Coastal Zone Management is discussed in Subchapter 3.1.3 of the May 2001 EA.

3.2 Socioeconomics

3.2.1 Demographics

Demographics are discussed in Subchapter 3.2.1 of the May 2001 EA.

3.2.2 Employment and Income

Employment and income are discussed in Subchapter 3.2.2 of the May 2001 EA.

3.2.3 Housing

Housing is discussed in Subchapter 3.2.3 of the May 2001 EA.

3.2.4 Tax Revenues and Expenditures

Tax revenues and expenditures are discussed in Subchapter 3.2.4 of the May 2001 EA.

3.3 Community Facilities and Services

3.3.1 Police, Fire & Rescue, and Medical Services

Police, fire and rescue, and medical services are discussed in Subchapter 3.3.1 of the May 2001 EA.

3.3.2 Schools

Schools are discussed in Subchapter 3.3.2 of the May 2001 EA.

3.3.3 Recreational Facilities

Recreational facilities are discussed in Subchapter 3.3.3 of the May 2001 EA.

3.4 Transportation

3.4.1 Highway and Street Network

The proposed relocation site on Fort Belvoir – the 1400 area of South Post – is served by the northern Virginia regional freeway and arterial transportation network, many sections of which are congested during both morning and afternoon commuting periods. This transportation system analysis addresses both the on-post transportation network and the connections between the post network and the regional transportation network.

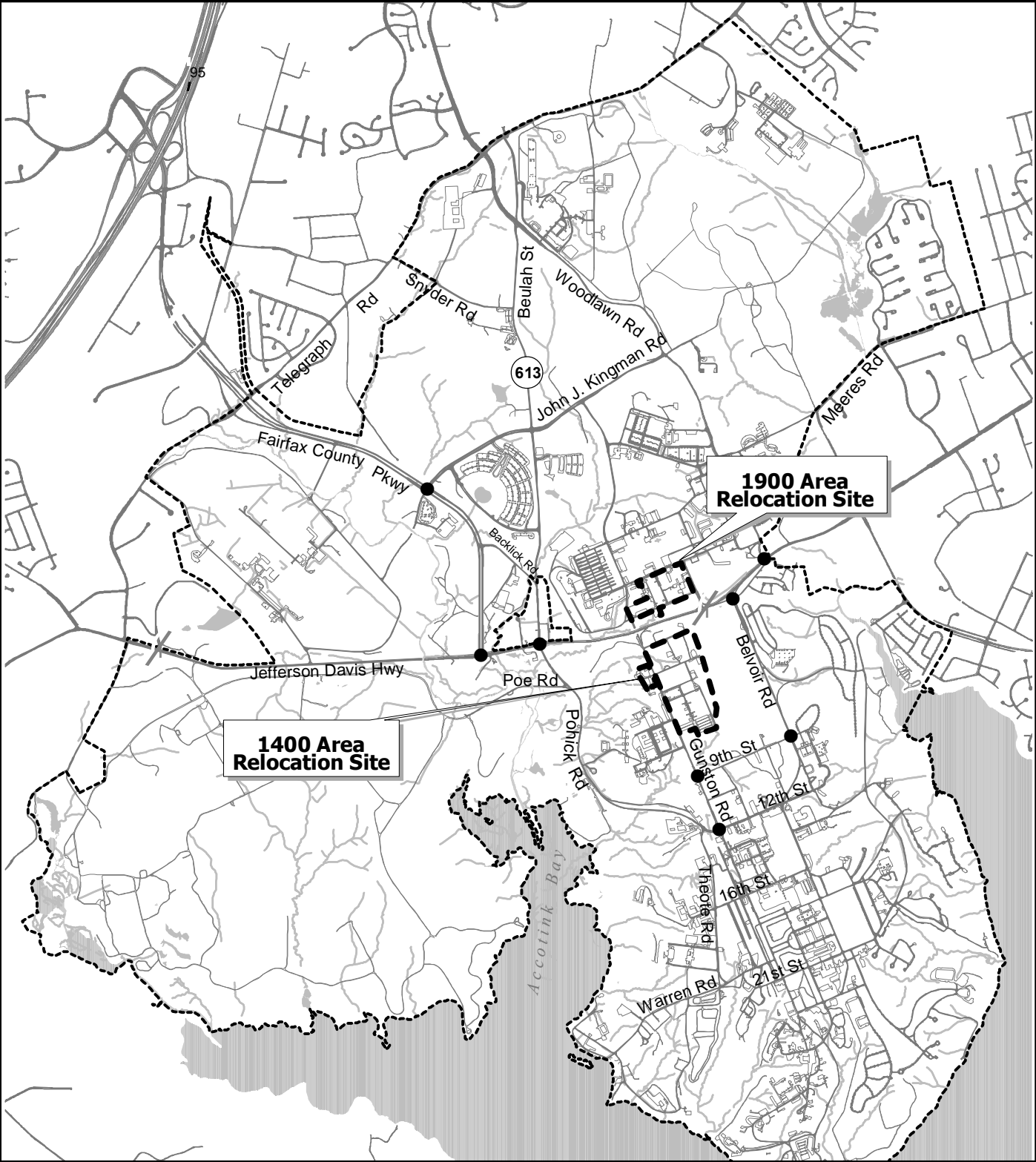
Four principal roadways define the northern Virginia highway system in the vicinity of Fort Belvoir ([Figure 3-2](#), Traffic Analysis Locations). These roadways are primarily used as major commuter and longer distance non-commuter routes. They are:

- I-95.
- US Route 1 (Jefferson Davis Highway).
- Fairfax County Parkway.
- Telegraph Road.

I-95 is a freeway that runs in a north-south direction approximately two mi (3.2 km) northwest of Fort Belvoir. Access to Fort Belvoir from I-95 is primarily via an interchange with the Fairfax County Parkway. Two additional interchanges on I-95, at Lorton Road and Route 1, also provide access to Fort Belvoir, predominantly from the south. In the vicinity of Lorton Road/Fairfax County Parkway, I-95 carried approximately 170,000 vehicles per day in 2000.

US Route 1 is classified as a principal arterial with a generally north-south regional orientation. However, the roadway runs in an east-west direction across Fort Belvoir. Through the installation, Route 1 is primarily a four-lane undivided highway with exclusive turn lanes at the major intersections. Access to Fort Belvoir is provided via three gates on Route 1. In 2000, Route 1 carried approximately 32,000 vehicles per day within the installation's boundaries.

Traffic Analysis Locations



- Study Intersection Location
- ▭ AMC Potential Relocation Area
- - - Fort Belvoir Main Post Boundary

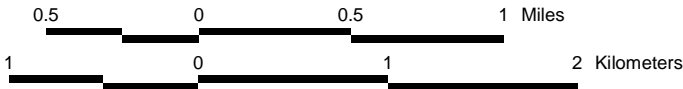


Figure 3-2

Fairfax County Parkway is classified as a principal arterial. The roadway is a four-lane divided facility connecting the post to I-95. A major access point to the North Post is via John J. Kingman Road and its intersection with the parkway at a point north of Route 1. In 2000, Fairfax County Parkway accommodated about 27,000 vehicles per day on the roadway segment north of John J. Kingman Road.

Telegraph Road, classified as a minor arterial, traverses the northern boundary of Fort Belvoir. Telegraph Road has recently been upgraded to a four-lane facility. The Beulah Street entrance to the Post from Telegraph Road was a major access point prior to the events of September 11, 2001. Since that time, the Beulah Street access point to Fort Belvoir from Telegraph Road has been closed to all traffic. In 2000, traffic volumes on Telegraph Road were approximately 17,000 vehicles per day in the vicinity of Fort Belvoir.

3.4.2 Existing Traffic Conditions

All traffic data collection for this EA was completed in March 2002 and represent normal operating conditions at Fort Belvoir at that time. Since the terrorist attacks of September 11, 2001, the post has instituted more strict access controls that have changed travel patterns to and within Fort Belvoir to the extent that prior traffic data are no longer pertinent.

3.4.2.1 Existing Traffic Volumes

The manual turning-movement traffic counts were obtained in March 2002 at the following eight intersections during morning and afternoon peak periods:

- Fairfax County Parkway and J .J. Kingman Road.
- Route 1 and Fairfax County Parkway.
- Route 1 and Backlick Road/Pohick Road.
- Route 1 and Belvoir Road.
- Route 1 and Woodlawn Road.
- Belvoir Road and 9th Street.
- Gunston Road and 9th Street.
- Gunston Road and Pohick Road/12th Street.

A summary of the peak-hour turning-movement counts at intersections is included in [Appendix B](#).

3.4.2.2 Traffic Analysis Methodology

Traffic operations are a function of traffic volume and available roadway capacity. The ratio between the volume and capacity is termed the volume-to-capacity (V/C) ratio. The standard industry procedure for determining the V/C ratio of a roadway facility is the 1997 *Highway Capacity Manual*. The *Highway Capacity Manual* contains planning-level procedures for assessing the adequacy of signalized intersections, two-way stop-controlled intersections, and four-way (or all-way) stop-controlled intersections. In each case, the procedures consider the number of vehicles turning or proceeding straight through the intersection, the number of lanes provided for each turning movement, and likely conflicts among turning vehicles.

For signalized intersections, the conflicts are summarized into a numerical value termed “critical lane volume.” The critical lane volume is divided into the intersection capacity to obtain a V/C ratio (Table 3-1).

Table 3-1
Signalized Intersection Level of Service Criteria

V/C Ratio	Assessment	Description
<0.85	Under Capacity	Stable flow, slight delays
0.85-0.95	Near Capacity	Approaching unstable flow, acceptable delays
0.95-1.00	At Capacity	Unstable flow, congested, unacceptable delays
>1.00	Over Capacity	Forced flow, oversaturation
Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, 1997.		

For unsignalized intersections, the typical distance between vehicles arriving at the intersection is calculated from the peak-hour traffic volumes to determine the likelihood of available gaps in major street traffic to allow turns to and from the minor street. The number of vehicles waiting on the minor street approaches and left turn bays on the major street is calculated using empirically based formulas. Average delays for these yielding vehicles are estimated. A qualitative assessment of intersection operation is made based on the average delay per vehicle, as shown in Table 3-2. Level of service (LOS) “A” reflects essentially free-flow conditions and LOS “F” reflects the maximum amount of wait time at a stop sign acceptable to most motorists.

Table 3-2

Level of Service Criteria for Unsignalized Intersections

Average Total Delay	Level of Service
< 10 seconds	A
10-15 seconds	B
15-25 seconds	C
25-35 seconds	D
35-50 seconds	E
> 50 seconds	F
Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, 1997.	

3.4.2.3 Existing Levels of Service

A traffic operational analysis was conducted for each of the study intersections. A summary of the intersection LOS for existing conditions is summarized in [Table 3-3](#) for the signalized intersections and [Table 3-4](#) for the unsignalized intersections. The following intersections are currently over capacity:

- Fairfax County Parkway and Kingman Road in the PM peak hour.
- US Route 1 and Fairfax County Parkway in both peak hours.
- US Route 1 and Backlick/Pohick Roads in the PM peak hour.

3.4.3 Transit System

3.4.3.1 Transit Service to Fort Belvoir Site

One Fairfax Connector Route (202) currently serves the proposed site in the 1400 area of Fort Belvoir. Two additional routes (Metrobus route 9A and Fairfax Connector route 107) operate on U.S. Route 1 in close proximity to the 1400 area. However, the grade separation at Gunston Road and Route 1 and the lack of an entrance gate at that location preclude the use of those routes by people located in the 1400 area.

Table 3-3

Signalized Intersection Levels of Service - Existing Conditions

Signalized Intersections	AM		PM	
	V/C Ratio	Capacity Status	V/C Ratio	Capacity Status
Fairfax County Pkwy/Kingman Road	0.76	Under Capacity	1.39	Over Capacity
Route 1/Fairfax County Parkway	1.03	Over Capacity	1.11	Over Capacity
Route 1/Backlick Rd/Pohick Rd	0.70	Under Capacity	1.06	Over Capacity
Route 1/Belvoir Road	0.80	Under Capacity	0.72	Under Capacity
Route 1/Woodlawn Road	0.60	Under Capacity	0.72	Under Capacity
Gunston Road/Pohick Road/12 th Street	0.37	Under Capacity	0.52	Under Capacity
Source: TransCore, 2002.				

Table 3-4

Stop-Controlled Intersection Levels of Service – Existing Conditions

Stop-Controlled Intersections	AM		PM	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Belvoir Road/9 th Street	C	23.8	D	29.5
Gunston Road/9 th Street	B	12.1	B	11.4
Source: TransCore, 2002.				

Fairfax Connector Route 202 – This route connects the South Post to the Franconia-Springfield Transportation Center. Service is provided to the 1400 area as the route operates along Gunston Road through the South Post. Service operates during peak periods and evenings only, primarily at a 30-minute frequency. Beyond the Franconia-Springfield Transportation Center, service continues to the Van Dorn Metrorail station. Service to the 1400 area is provided from approximately 6:45 AM to 9:45 AM and from approximately 3:30 PM to 9:00 PM. A proposal is currently being considered by Fairfax County to reduce service on this route as part of an overall budget reduction by the county. If the proposed reduction, which would take effect in October 2002, is approved, service would terminate at the McNamara HQC and the route would no longer serve the South Post. This would leave the 1400 area with no transit service.

3.4.3.2 Transit Usage

Ridership on Fairfax Connector Route 202 had been increasing by approximately three to five percent per year during the last few fiscal years. However, that trend has changed and ridership has decreased since September 11, 2001. Fairfax Connector staff attributes part of the loss to the increased security measures at Fort Belvoir which have required a change in the route followed by the buses and increased the travel time. Route 202 had been averaging approximately 400 riders per day prior to September 11, 2001. Since that time, the route has averaged approximately 360 riders per day. On the basis of the current ridership level and anticipated growth rate, the route is expected to have available capacity through the 2003 horizon year.

No stop-by-stop ridership counts exist for the various bus stops located in or adjacent to the 1400 area of the South Post. However, some general ridership assumptions for the South Post area can be made on the basis of available data. During transit counts conducted by TransCore in April 2001, 18 passengers remained aboard the six AM peak period trips on Route 202 when the buses left the McNamara HQC. It can be assumed that the majority of these passengers were destined for various locations on the South Post, including the 1400 area.

3.5 Air Quality

3.5.1 National Ambient Air Quality Standards

The USEPA, under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants, referred to as criteria pollutants (40 CFR 50). These are: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM), lead (Pb), and sulfur dioxide (SO₂). The NAAQS include primary and secondary standards. The primary standards ([Table 3-5](#)) were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. A description of the criteria pollutants and their effects on the public health and welfare is presented in [Table 3-6](#).

Table 3-5

National and Virginia Ambient Air Quality Standards

Pollutant and Averaging Time	Primary Standard		Secondary Standard	
	$\mu\text{g}/\text{m}^3$	ppm	$\mu\text{g}/\text{m}^3$	ppm
Carbon Monoxide				
8-hour concentration	10,000 ¹	9 ¹	Same as primary	
1-hour concentration	40,000 ¹	35 ¹		
Nitrogen Dioxide				
Annual Arithmetic Mean	100	0.053	Same as primary	
Ozone				
8-hour concentration	157 ²	0.08 ²	Same as primary	
1-hour concentration	235 ³	0.12 ³		
Particulate Matter				
<u>PM2.5:</u>			Same as primary	
Annual Arithmetic Mean	15 ⁴	-		
24-hour Maximum	65 ⁵	-		
<u>PM10:</u>				
Annual Arithmetic Mean	50 ⁴	-		
24-hour concentration	150 ⁶	-		
Lead				
Quarterly Arithmetic Mean	1.5	-	Same as primary	
Sulfur Dioxide				
Annual Arithmetic Mean	80	0.03	-	-
24-hour concentration	365 ¹	0.14 ¹	-	-
3-hour concentration	-	-	1300 ¹	0.50 ¹
Notes: ¹ Not to be exceeded more than once per year. ² 3-year average of the 4th highest 8-hour concentration may not exceed 0.08 ppm. ³ Areas not attaining the 1-hour standard must meet that standard before demonstrating attainment with the 8-hour standard. ⁴ Based on 3-year average of annual averages. ⁵ Based on 3-year average of annual 98th percentile values. ⁶ Based on a 3-year average of annual 99th percentile values. Source: 40 CFR 50; USEPA Fact Sheets, July 1997. <i>Virginia Ambient Air Monitoring 2000 Data Report</i> , VDEQ.				

Table 3-6

Criteria Pollutants - Their Sources and Effects

Pollutants and Their Sources	Health and Welfare Effects
Ozone (O₃): O ₃ is not emitted directly into the atmosphere. It is formed in the atmosphere by a series of complex chemical reactions primarily involving nitrogen dioxides and volatile organic compounds in the presence of heat and sunlight. These reactions are time-dependent and usually take place far downwind from the site where these ozone precursors were originally emitted. Typical sources of these precursors are motor vehicle exhaust and industrial processes using solvents.	Health: O ₃ is a highly reactive gas that irritates the mucous membranes and other lung tissues, causing respiratory impairment. O ₃ has been found to affect those with respiratory problems, such as asthma, as well as healthy adults and children. Effects include breathing difficulty while exercising and reduced resistance to respiratory infections. Acute exposures cause bronchial constriction, lung edema, and abnormal lung development. Welfare: Toxic to plants, causing leaf damage and decrease in growth. Weakens materials such as rubber and fabrics.
Carbon Monoxide (CO): The major source of CO is the incomplete combustion of fuels used to power engines, etc. Motor vehicles are the principal source of urban CO emissions. CO is a site-specific pollutant with high levels found near the source, such as at heavily-congested intersections. Other sources include power plants, industrial processes, and space heating.	Health: CO enters the bloodstream by combining with hemoglobin, which reduces the amount of oxygen carried to organs and tissue. The health threat is most severe for those with cardiovascular disease. Healthy individuals are affected at higher concentrations (>30 ppm). Symptoms include shortness of breath, chest pain, headaches, confusion, and loss of coordination. Welfare: No known effect on materials or vegetation.
Sulfur Dioxide (SO₂): SO ₂ results largely from the combustion of sulfur-bearing fuels such as coal and oil combustion in heat and power generation facilities. Other sources include pulp and paper mills, refineries, and nonferrous smelters. The combustion of gasoline and diesel fuels in motor vehicles accounts for a very small percentage of the total sulfur dioxides emitted.	Health: SO ₂ combines with water vapor to form acidic aerosols which irritate the respiratory tract. It aggravates symptoms associated with chronic lung diseases such as asthma and bronchitis. Welfare: SO ₂ is a primary contributor to acid deposition, which causes acidification of lakes and streams. Acid deposition also damages materials (corrodes metals, degrades rubber and fabrics), injures vegetation, and causes visibility degradation.
Nitrogen Dioxide (NO₂): NO ₂ is formed in the atmosphere from the oxidation of nitric oxide (NO). The major sources of NO is fuel combustion in boilers and engines associated with power plants, motor vehicles, industrial furnaces and space heating.	Health: NO ₂ can cause irritation to the lungs, lower resistance to respiratory infections, and aggravate symptoms associated with asthma and bronchitis. Welfare: NO ₂ decreases visibility by causing a reddish-brown haze. It is a contributor to acid deposition, which causes acidification of lakes and streams, as well as plant injury and damage to materials (metals, rubber, fabric).
Particulate Matter (PM₁₀): PM, which occurs as a result of incomplete combustion, consists of tiny airborne particles or aerosols combined with dust, dirt, smoke, and liquid droplets. PM ₁₀ is PM with an aerodynamic diameter of 10 microns or less. Sources of PM are factories, power plants, motor vehicles, construction activities, and fires. More particulates are contributed to the atmosphere by diesel fuel than gasoline.	Health: PM ₁₀ particles, because of their small size, are able to be inhaled and reach the thoracic region of the respiratory system. The health effects are often not immediately noticed. The particulates can accumulate in the lungs after long-term exposure and affect breathing and respiratory symptoms. The lung's natural cleansing and defense mechanisms are impaired. Welfare: Causes soiling and corrosion to materials. Decreases visibility by forming atmospheric haze.
Lead (Pb): The primary source for airborne Pb used to be motor vehicles, but the use of unleaded gas has dramatically reduced Pb emissions.	Health: Causes mental retardation and brain damage, especially in children. Causes liver disease; may be a factor in high blood pressure. Also damages the nervous system. Welfare: No direct impact on vegetation.

The CAA requires that the USEPA review scientific data every five years to ensure that the NAAQS effectively protect the public health. The USEPA has enacted a more stringent standard for O₃, which became effective on September 16, 1997. The final standard has been updated from 0.12 parts per million (ppm) of O₃ measured over one hour to a standard of 0.08 ppm measured over eight hours, with the average fourth-highest concentration over a three-year period determining whether or not an area is in compliance.

Additionally, a new standard for PM₁₀ was issued on July 18, 1997 by the USEPA. The standard for PM₁₀ remains essentially unchanged, while a new standard for fine particles (PM_{2.5}: diameter 2.5 micrometers) is set at an annual limit of 15 micrograms per cubic meter (µg/m³), with a 24-hour limit of 65 µg/m³. Because this new standard would regulate fine particulates for the first time, the USEPA will allow five years to build a nationwide monitoring network and to collect and analyze the data needed to designate areas and develop implementation plans.

Both revised O₃ and new PM_{2.5} standards were contested in court over the last few years. In February 2001, the Supreme Court upheld USEPA's authority under the CAA to set national air quality standards. On March 26, 2002, the D.C. Circuit Court rejected all remaining challenges to both standards. Therefore, USEPA will move forward with programs to implement both new standards.

3.5.2 National Ambient Air Quality Standard Attainment Status

Areas that meet the NAAQS for a criteria pollutant are designated as being "in attainment;" areas where a criteria pollutant level exceeds the NAAQS are designated as being "in nonattainment." O₃ nonattainment areas are categorized based on the severity of their pollution problem - marginal, moderate, serious, severe, and extreme. CO and PM₁₀ nonattainment areas are categorized as moderate and serious nonattainment areas. Where insufficient data exist to determine an area's attainment status, it is designated unclassifiable (or attainment). Ft. Belvoir is located along the western shore of the Potomac River, in Fairfax County, Virginia, an area currently designated as being in:

- Serious nonattainment for O₃; and
- Attainment for all other criteria pollutants.

3.5.3 State Implementation Plan

The CAA as amended in 1990 (CAAA) mandates that state agencies adopt SIPs that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth plans to expeditiously achieve and maintain attainment of the NAAQS. The SIP applicable to this nonattainment area is the *Final State Implementation Plan Revision, Phase I Attainment Plan*

(Metropolitan Washington Council of Governments [MWCOG], October 1997) and *State Implementation Plan Revision, Phase II Attainment Plan for the Washington DC-MD-VA Nonattainment Area* (MWCOG, February 3, 2000).

The SIP sets forth how emissions that contribute to the formation of O₃ will be reduced by 15 percent from 1990 to 1996, and then by three percent per year until the area reaches attainment of the NAAQS. The attainment date for the Washington metropolitan area was 1999, necessitating a 24 percent total reduction in emissions. A plan for reducing emission levels by 15 percent from 1990 to 1996 was approved by the Metropolitan Washington Air Quality Committee (MWAQC) in December 1993. Subsequently, a Post-1996 Rate of Progress Plan was developed and approved by MWAQC in October 1997 with revisions in April 1999. This plan shows how the additional nine percent in reductions required by 1999 will be achieved.

The Phase II Attainment Plan evaluates whether the measures included in the Phase I nine percent plan and other steps being taken are adequate to reach attainment in the Washington metropolitan area. As part of the Phase II Plan, the Washington region must submit a demonstration using an urban air quality model to show that O₃ concentrations will be reduced to levels below the NAAQS. However, the modeling results show that even with the local measures required to meet the 24 percent rate of progress requirement, air quality in the region will only meet the O₃ NAAQS if overwhelming transport of pollutants into the region from other areas is reduced. MWAQC anticipates that the Washington metropolitan area will attain the O₃ standard based upon data from the ozone seasons in 2003-2005. Therefore, MWAQC, the states of Maryland and Virginia, and the District of Columbia requested an extension of the 1999 attainment date until 2005. On January 3, 2001, the USEPA finalized its approval of the Phase II Attainment Plan and approved the extension of the 1-hour attainment date to 2005.

3.5.4 Local Ambient Air Quality

Air quality data for Virginia are collected by the Virginia Department of Environmental Quality (VDEQ) at representative sites throughout the state. The most recent available data (for the year 2000) from nearby monitoring stations are used to describe the existing ambient air quality at Ft. Belvoir ([Table 3-7](#)). The measured ambient air concentrations were well below the corresponding NAAQS except for O₃. The O₃ exceedence is expected since the region within which Ft. Belvoir and the O₃ monitoring sites are located has been designated an O₃ nonattainment area.

3.5.5 Mobile Sources

Primary automobile-related or mobile-source air pollutants are CO, NO_x and volatile organic compounds (VOCs). Lead emissions from automobiles are not significant and have declined in

Table 3-7
Local Ambient Air Quality

Pollutant and Averaging Time	Monitored Data	Primary Standard	Secondary Standard	Monitoring Site Location
Carbon Monoxide 8-hour maximum (ppm) 1-hour maximum (ppm)	2.4 3.1	9 35	9 35	Franconia, Lee District Park
Nitrogen Dioxide Annual Arithmetic Mean (ppm)	0.009	0.053	0.053	Long Park, Prince William County
Ozone 8-hour maximum (ppm) 1-hour maximum (ppm)	0.101 0.125	0.08 0.12	0.08 0.12	2675 Sherwood Hall Lane
Particulate Matter (PM _{2.5}) Annual Arithmetic Mean ($\mu\text{g}/\text{m}^3$) 24-hour Maximum ($\mu\text{g}/\text{m}^3$)	14.1 37.5	15 65	15 65	Lee District Park
Particulate Matter (PM ₁₀) Annual Arithmetic Mean ($\mu\text{g}/\text{m}^3$) 24-hour Maximum ($\mu\text{g}/\text{m}^3$)	23 54	50 150	50 150	Manassas Health Department, Prince William County
Sulfur Dioxide Annual Arithmetic Mean (ppm) 24-hour Maximum (ppm) 3-hour Maximum (ppm)	0.011 0.037 0.057	0.030 0.140 -	- - 0.500	1437 Balls Hills Road
Lead Quarterly Maximum ($\mu\text{g}/\text{m}^3$)	0.102	1.5	1.5	Manassas Health Department, Prince William County
Source: Virginia Ambient Air Monitoring 2000 Data Report, VDEQ.				

recent years through the increased use of unleaded gasoline. Potential emissions of particulates and sulfur dioxide from indirect, mobile sources such as automobiles are insignificant in comparison with direct, non-mobile emission sources such as power plants and industrial facilities. Therefore, only vehicular CO, NO_x and VOC emissions are considered in this study.

Air quality impacts from traffic (and traffic associated with development projects) are generally evaluated at two scales:

- Microscale: CO, which is emitted predominantly by motor vehicles, is a site-specific pollutant with higher concentrations found adjacent to roadways. As a result, it is usually of concern on a local or microscale basis. CO air quality impacts are typically evaluated through a microscale analysis of traffic-related emission impacts at specific intersections.
- Mesoscale: NO_x and VOCs, precursors of ozone, are usually of regional concern due to the Northern Virginia nonattainment status for ozone. Potential emission increases from additional vehicle miles traveled (VMT) may affect regional ozone levels and may require a mesoscale impact analysis.

Existing VOCs and NO_x mobile emissions are not site-specific and are considered only on a regional basis (mesoscale), which is beyond the scope of this analysis. However, VOC and NO_x emissions induced by the Proposed and Alternative Actions on the project site need to be analyzed and are further discussed in [Subchapter 4.5](#). A microscale analysis of the localized existing CO concentrations was performed based on the existing traffic conditions discussed in [Chapter 3.4](#) and is detailed below.

Microscale Analysis

The CO microscale air quality analysis is based on procedures outlined in the following documents:

- A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections (USEPA, September 1995);
- Mobile5b User's Guide (USEPA, April 1997); and
- MWCOG provided Mobile5b input parameters (Tangirala, January 11, 2000).

Mathematical Models

CO traffic impacts are determined in two steps: 1) vehicle exhaust emission factors are calculated using the USEPA Mobile5b computer model; and 2) these emission factors are subsequently used as input for the USEPA CAL3QHC dispersion model to calculate CO concentrations. The models used are described as follows:

- Mobile5b generates vehicular emission factors based on locality-specific vehicle fleet characteristics including vehicle age, operating mode of vehicles (hot/cold starts), and percentage of oxygenated fuel used. Additionally, Mobile5b can incorporate adopted emission control strategies such as anti-tampering programs and inspection and maintenance (I/M) programs.
- CAL3QHC (Version 2) predicts the level of CO or other pollutant concentrations from motor vehicles traveling near roadway intersections. The model incorporates inputs such as roadway geometry, traffic volumes, vehicular emission rates, and meteorological conditions.

CO Impact Assessment

The worst-case CO impacts were estimated for receptor locations at two intersections during weekday am and pm peak periods. These two intersections are the intersection of US Route 1 and Backlick and Ft. Belvoir Roads and the intersection of J. J. Kingman Road and Fairfax County Parkway. The intersections were selected for modeling based upon the maximum potential increase in traffic and CO impact at the affected roadways.

Locality-specific composite emission factors were estimated using the Mobile5b model with the MWCOG provided area-specific input parameters. Idle emission rates were determined in accordance with USEPA guidance.

The microscale CO analysis model incorporated the emission factors, current traffic volumes and intersection phasing data, and worst case meteorological conditions. These data were used to determine the maximum air quality impact of the existing roadway conditions.

Total ambient CO concentrations near intersections consist of two components -- local source contributions (i.e., vehicular emissions near intersections) and background contribution from other sources, such as stationary sources and natural sources, in the project vicinity. Background CO levels in the Fairfax County area were obtained from the VDEQ (Ballou, February 4, 2000). The one-hour background CO concentration is 6 ppm, and the eight-hour background CO concentration is 3 ppm.

A persistence factor of 0.70 was used to convert the one-hour CO concentrations calculated by CAL3QHC to eight-hour concentrations. The persistence factor represents a combination of the variability in both traffic and meteorological conditions.

The predicted worst-case CO impacts are presented in [Table 3-8](#). The worst-case CO conditions occurred during the pm peak period at the intersection of US Route 1 and Backlick and Ft. Belvoir Roads and during the am peak period, at the intersection of J. J. Kingman Road and Fairfax County Parkway. The modeling results indicate no existing violations of the one-hour CO standard of 35 ppm and the eight-hour CO standard of 9 ppm at the modeled intersections.

Table 3-8

Weekday Existing Carbon Monoxide Levels

Intersection Receptor Location	One-Hour Concentration (ppm)	Eight-Hour Concentration (ppm)
US Route 1 and Backlick and Ft. Belvoir Roads	9.7	5.6
J. J. Kingman Road and Fairfax County Parkway	9.4	5.4
Note: CO levels include background concentrations of 6 ppm (one-hour) and 3 ppm (eight-hour).		

3.5.6 Stationary Sources

Stationary sources at Ft. Belvoir include 35 boilers, 31 generators, 2 incinerators, 9 underground storage tanks (USTs), a firefighting training facility, and over 225 insignificant sources of air emissions. The insignificant sources include closed sanitary landfills, above ground storage tanks (ASTs), spray painting operations, welding operations, asphalt paving activities, degreasers, oil-water separators, woodworking activities, printing operations, pesticide application activities, residential and other smaller No. 2 fuel oil and natural gas boilers, and emergency generators (Werner, April 24, 2001).

Based on the type of pollutants emitted (criteria pollutants or hazardous air pollutants [HAPs]), the CAAA sets forth permit rules and emission standards for sources of certain sizes. The New Source Performance Standards (NSPS) apply to sources emitting criteria pollutants, while the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to sources emitting HAPs. The USEPA oversees programs for stationary source operating permits (Title V) and for new or modified major stationary source construction and operation (New Source Review).

The Title V major source thresholds (based on the facility's Potential to Emit) applicable to Ft. Belvoir are:

- 50 tons per year (tpy) VOCs or NO_x;
- 100 tpy other criteria pollutants;
- 25 tpy total HAPs; or
- 10 tpy for any one HAP.

Fort Belvoir is a major source for NO_x and SO₂. A Title V permit application was submitted for the facility in March 1998. The application was given a completeness review by VDEQ and determined to be complete. The technical review of the application was completed and a draft permit was issued in September 2000. Responses to comments on the draft permit were submitted to VDEQ in

January 2001 and a final Title V Permit for the facility is expected in 2002 (Werner, April 24, 2001 and May 2, 2002).

3.5.7 Clean Air Act Conformity

The CAAA of 1990 expand the scope and content of the Act's conformity provisions in terms of their relationship to a SIP. Under Section 176(c) of CAAA, a project is in “conformity” if it corresponds to a SIP’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. Conformity further requires that such activities would not:

- (1) Cause or contribute to any new violations of any standards in any area;
- (2) Increase the frequency or severity of any existing violation of any standards in any area; or
- (3) Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The USEPA published final rules on general conformity (40 CFR Parts 51 and 93 in the *Federal Register* on November 30, 1993) that apply to federal actions in areas designated nonattainment for any of the criteria pollutants under the CAAA. The proposed rules specify *de minimis* emission levels by pollutant to determine the applicability of conformity requirements for a project. In this case, the project area is located in a serious nonattainment region for O₃. For a serious O₃ nonattainment area, the de minimis criterion is 50 tpy (45 metric tpy) for both NO_x and VOCs.

An applicability analysis of the Proposed Action under the general conformity rule is discussed in [Subchapter 4.5](#).

3.6 Noise

Noise is discussed in Subchapter 3.6 of the May 2001 EA.

3.7 Infrastructure

The following information regarding utility infrastructure on the 1400 area and 1900 area relocation sites is from the feasibility report for the relocation of Headquarters AMC and the Fort Belvoir geographic information system (GIS).

3.7.1 Water Supply

Potable water is supplied to Fort Belvoir by the Fairfax County Water Authority (FCWA). The installation owns, operates and maintains the entire on-post distribution system. This includes about 78 mi (126 km) of more-than-6-in (15-cm) water main pipes, two pumping stations, four storage tanks (three elevated, one ground-level) providing about 2.6 million gallons (gal) (9.8 million liters [l]) of storage capacity, and a chlorination unit. A total of 2.2 million gallons per day (MGD) (8.3 million liters per day [MLD]) are provided through two points of entry (two FCWA meter vaults/pump stations on Pole Road and Telegraph Road). Fort Belvoir also has five groundwater wells, used for irrigation only. Fort Belvoir's water system will be fully privatized in the near term.

1400 Area Relocation Site

A 12-inch (in) (30-centimeter [cm]) diameter asbestos cement water main runs along the north side of Gunston Road, along the 1400 area relocation site. Two 6-in (15-cm) diameter mains branch off the 12-in (30-cm) main at 3^d and 4th Streets and connect to a 10-in (25-cm) main that crosses the site to provide water to Building 1444.

1900 Area Relocation Site

On the perimeter of the 1900 area relocation site, water lines range in diameter from 10 in (25 cm) along Black Road to the east, to 8 in (20 cm) along Goethals Road, to 6 in (15 cm) along Meade Road. Water lines within the site interior are typically 6-in (15-cm) lines and are located near the site center in a north-south orientation, perpendicular to Meade and Goethals Roads.

3.7.2 Sanitary Sewer

Sanitary sewer is discussed in Subchapter 3.7.2 of the May 2001 EA.

1400 Area Relocation Site

The 1400 area relocation site is crossed by several 8-in (20-cm) and 10-in (25-in) diameter vitrified clay polyethylene sewer lines, which flow by gravity to a 15-in (38-cm) diameter

vitified clay pipe at the southeast corner of the site, at the intersection of Hall Road and 5th Street. These lines serve existing buildings adjacent to the 1400 area relocation site.

1900 Area Relocation Site

The existing onsite wastewater lines are 8-in (20-cm) diameter lines. Three lines run in an east-west orientation across most of the 1900 area relocation site; one line runs north-south and is located in the eastern third of the site.

3.7.3 Stormwater

Stormwater is discussed in Subchapter 3.7.3 of the May 2001 EA.

1400 Area Relocation Site

There are no known active stormwater pipes in the area of the site. Some corrugated metal pipe culverts cross under roadways in the area. Two parallel 18-in (46-cm) concrete stormwater mains redirect stormwater from the 1467 parking lot to the westernmost branch of an unnamed tributary of Accotink Creek. The unnamed tributary in the northwest portion of the 1400 area relocation site has several problems resulting from erosion downstream of the site, including an exposed 12-in (30-cm) drinking water main.

1900 Area Relocation Site

There are no known active stormwater pipes in the area of the 1900 area relocation site.

3.7.4 Electricity

Electricity is discussed in Subchapter 3.7.4 of the May 2001 EA.

1400 Area Relocation Site

Electrical power is supplied to the 1400 area relocation site by a 34.5 kilovolt-ampere (KVA) overhead electric line north of 1st Street and west of Gunston Road. Several 27.5 KVA overhead electric lines also cross the site.

1900 Area Relocation Site

Various voltages are present on the 1900 area relocation site including 34.5 kV, 12.47 kV and 4.16 kV, all provided via the overhead electrical system. The overhead system runs along

Goethals Road on the north, Gunston Road on the west, and along a portion of Meade Road on the south. Multiple overhead lines cross the interior of the site.

3.7.5 Natural Gas

Natural gas is discussed in Subchapter 3.7.5 of the May 2001 EA.

1400 Area Relocation Site

A gas line runs along Gunston Road adjacent to the 1400 area relocation site.

1900 Area Relocation Site

Natural gas pipelines do not presently exist on the 1900 area relocation site, although a 6-in (15-cm) line exists south of the site along Route 1.

3.7.6 Steam

Steam is discussed in Subchapter 3.7.6 of the May 2001 EA.

3.7.7 Communications

Communications is discussed in Subchapter 3.7.7 of the May 2001 EA.

1400 Area Relocation Site

There are no known active communications lines on the 1400 area relocation site, although there is evidence of numerous abandoned underground telephone cables in the area.

1900 Area Relocation Site

There are no known active communications lines on the 1900 area relocation site.

3.7.8 Solid Waste

Solid waste is discussed in Subchapter 3.7.8 of the May 2001 EA.

3.8 Cultural Resources

3.8.1 Historical Overview

An historical overview of Fort Belvoir is provided in Subchapter 3.8.1 of the May 2001 EA.

3.8.2 Integrated Cultural Resources Management Plan (ICRMP)

The *Integrated Cultural Resources Management Plan (ICRMP) of US Army Garrison Fort Belvoir* (US Army Garrison Fort Belvoir, February 2001) is discussed in Subchapter 3.8.2 of the May 2001 EA.

1400 Area and 1900 Area Relocation Sites

The 1400 area and 1900 area relocation sites do not contain any cultural resources. The Camp A. A Humphreys Pump Station and Filter Building lies approximately 2,500 feet (ft) (760 meters [m]) to the northwest of the 1400 area relocation site and 2,500 ft (760 m) west-southwest of the 1900 area relocation site. According to the ICRMP, soils in both the 1400 area and 1900 area relocation sites have been disturbed and have no archaeological potential.

3.9 Natural Resources

3.9.1 Topography and Geology

Topography and Geology are discussed in Subchapter 3.9.1 of the May 2001 EA.

1400 Area Relocation Site

The 1400 area relocation site terrain is flat to gently rolling. Elevations vary from a high of about 135 ft (41 m) above mean sea level (msl) to a low of about 115 ft (35 m) above msl, with the exception of lower elevations in a drainage swale at the northwestern corner of the site. The swale drops to an elevation of approximately 105 ft (32 m) on the east side of Gunston Road between 1st and 3rd Streets. The site is located on a plateau sloping steeply to Accotink Creek lowlands to the west, and a number of steep-sided ravines on the north, west, and south that give rise to tributaries of Accotink Creek.

1900 Area Relocation Site

The 1900 area relocation site is located upslope on the same plateau as the 1400 area relocation site. The site terrain is generally flat. The 1900 area relocation site slopes gently from a low of

about 130 ft (40 m) above msl in its southwest corner, at the intersection of Gunston Road and Meade Road, to a high of over 140 ft (43 m) in the eastern portion of the site.

3.9.2 Floodplains

Floodplains are discussed in Subchapter 3.9.2 of the May 2001 EA.

1400 Area and 1900 Area Relocation Sites

According to FEMA maps, no 100-year floodplains occur within the 1400 area or 1900 area relocation sites. The 100-year floodplains associated with Accotink Creek occur to the west of Gunston Road, approximately 250 ft (76 m) west of the 1400 area relocation site, and about 400 ft (122 m) west of the 1900 area relocation site.

3.9.3 Soils

Soils are discussed in Subchapter 3.9.3 of the May 2001 EA.

1400 Area and 1900 Area Relocation Sites

Soil types mapped at both the 1400 area and 1900 area relocation sites are the non-series units “cut and fill” and “Urban Land.” Cut and fill consists generally of soils of unknown origin that have been brought into construction sites, and are likely to have high structural stability. Urban Land is generally composed of native soils on ridge tops or other flat areas where development has occurred. These soils have generally been altered to some degree by construction and landscape management.

3.9.4 Groundwater

Groundwater is discussed in Subchapter 3.9.4 of the May 2001 EA.

3.9.5 Surface Water

Surface water is discussed in Subchapter 3.9.5 of the May 2001 EA.

1400 Area Relocation Site

There are no perennial waterbodies on the 1400 area relocation site. The site drains to two tributaries to Accotink Creek ([Figure 3-3](#), Environmental Protection Areas). Subwatershed 01 drains the northern part of the site, and contains an intermittent stream that is carried under Gunston Road through a culvert. Subwatershed 03 drains the southern part of the site, and contains a stream that is intermittent on the site and becomes perennial just downstream of the site. Several other small tributaries to Accotink Creek dissect the steep slopes to the west of the 1400 area relocation site.

There are no stormwater management structure on the 1400 area relocation site. Stormwater is carried by swales on site to pipes that outfall at several locations to the streams in Subwatersheds 01 and 03. Both of these stream channels have been highly impacted by the lack of stormwater management on the site, exhibiting moderate to severe downcutting and scour downgradient from the site. Both streams carry stormwater and the associated silt load to the Accotink Bay Wildlife Refuge prior to discharging into Accotink Creek and, ultimately, Accotink Bay.

The stream in Subwatershed 03 is one of the five installation waterways that were monitored from 1998 through 2001. The monitoring results indicated an aquatic community highly affected by unmoderated stormwater flows. In 2000, fort Belvoir implemented a watershed restoration project to stabilize sections of this stream.

1900 Area Relocation Site

There are no perennial waterbodies on the 1900 area relocation site. The site is within two subwatersheds of Accotink Creek. Most of the site is within Subwatershed 29, which contains an intermittent stream. Existing stormwater facilities consist of drainage channels and pipes that outfall into two branches of the intermittent stream. The smaller, northeast portion of the site is within Subwatershed 30.

The onsite drainage channels have existing problems, including downcutting. Downstream from the site, the stream channel in Subwatershed 29 exhibits such stormwater-related problems as excessive scour and severe downcutting. This stream also passes through the Accotink Bay Wildlife Refuge, where it affects the condition of the riparian and wetland areas.

3.9.6 Vegetation

Vegetation is discussed in Subchapter 3.9.6 of the May 2001 EA.

1400 Area Relocation Site

The 1400 area relocation site comprises a mixture of improved and semi-improved grounds, such as buildings and landscaped areas. Dominant vegetation at this site includes mixed turf grasses and landscape trees and shrubs along the site periphery, in parking lot islands, and in association with the existing buildings.

Most of the northern portion of the 1400 area relocation site, north of 5th Street, comprises a park-like landscape of widely-spaced, mature trees with a mowed grass understory. Some of the trees in this area may have been planted, although many appear to be remnants from an earlier forest. The area had been cleared previously for building sites and, during the clearing process, many trees and the understory were removed, but some large trees may have been retained. The most common tree here is white oak (*Quercus alba*), followed by southern red oak (*Quercus falcate*). Additional species include: northern red oak (*Quercus rubrum*), sycamore (*Platanus occidentalis*), Virginia pine (*Pinus virginiana*), chestnut oak (*Quercus prinus*), tulip poplar (*Liriodendron tulipifera*), willow oak (*Quercus phellos*), pignut hickory (*Carya glabra*), black gum (*Nyssa sylvatica*), and beech (*Fagus grandifolia*).

A woodlot, encompassing about three ac (one ha), is located in the northeast corner of the site, north of 3rd Street. The woodlot is dominated by white oaks, scarlet oaks (*Quercus coccinea*), and loblolly pines (*Pinus taeda*).

Trees are generally absent along the eastern portion of the site south of 3rd Street. In the southern portion of this area, south of 5th Street, a 30-ft (9-m) wide strip of mowed lawn runs along the east side of Hall Road, bordered on the east by a parallel strip of open field vegetation and shrubs. The open field vegetation is in an area that Fort Belvoir has taken out of active mowing to enhance wildlife habitat and benefit wildlife. The shrub area is dominated by brambles (*Rubus* spp.).

1900 Area Relocation Site

Vegetation on the 1900 area relocation site, similar to the 1400 area relocation site, is a mixture of improved and semi-improved areas, dominated by turf grasses and landscape trees and shrubs. However, although mature trees are present in both relocation sites, the trees in the 1900 area relocation site are younger than those in the 1400 area relocation site, reflecting the younger age of the development in the 1900 area relocation site.

3.9.7 Wetlands and Chesapeake Bay Preservation Areas

Wetlands and Chesapeake Bay preservation areas are discussed in Subchapter 3.9.7 of the May 2001 EA. [Figure 3-3](#) shows wetlands and Chesapeake Bay preservation areas in the vicinity of the 1400 area and 1900 area relocation sites.

3.9.7.1 Wetlands

1400 Area and 1900 Area Relocation Sites

Neither the 1400 area relocation site nor the 1900 area relocation site contain jurisdictional wetlands. An approximately 0.3-ac (0.1-ha) wetland is situated in a small tributary to Accotink Creek, about 200 ft (61 m) west of the northwest corner of the 1400 area relocation site.

3.9.7.2 Chesapeake Bay Preservation Areas

1400 Area and 1900 Area Relocation Sites

According to Fairfax County Resource Protection Area (RPA) maps, there are no RPAs on the 1400 area or 1900 area relocation sites. The closest mapped RPA for the 1400 area relocation site is associated with tributaries to Accotink Creek, approximately 250 ft (76 m) west of the site, to the west of Gunston Road. The closest RPAs to the 1900 area relocation site are also associated with tributaries to Accotink Creek, and are about 400 ft (122 m) of the site.

3.9.8 Wildlife

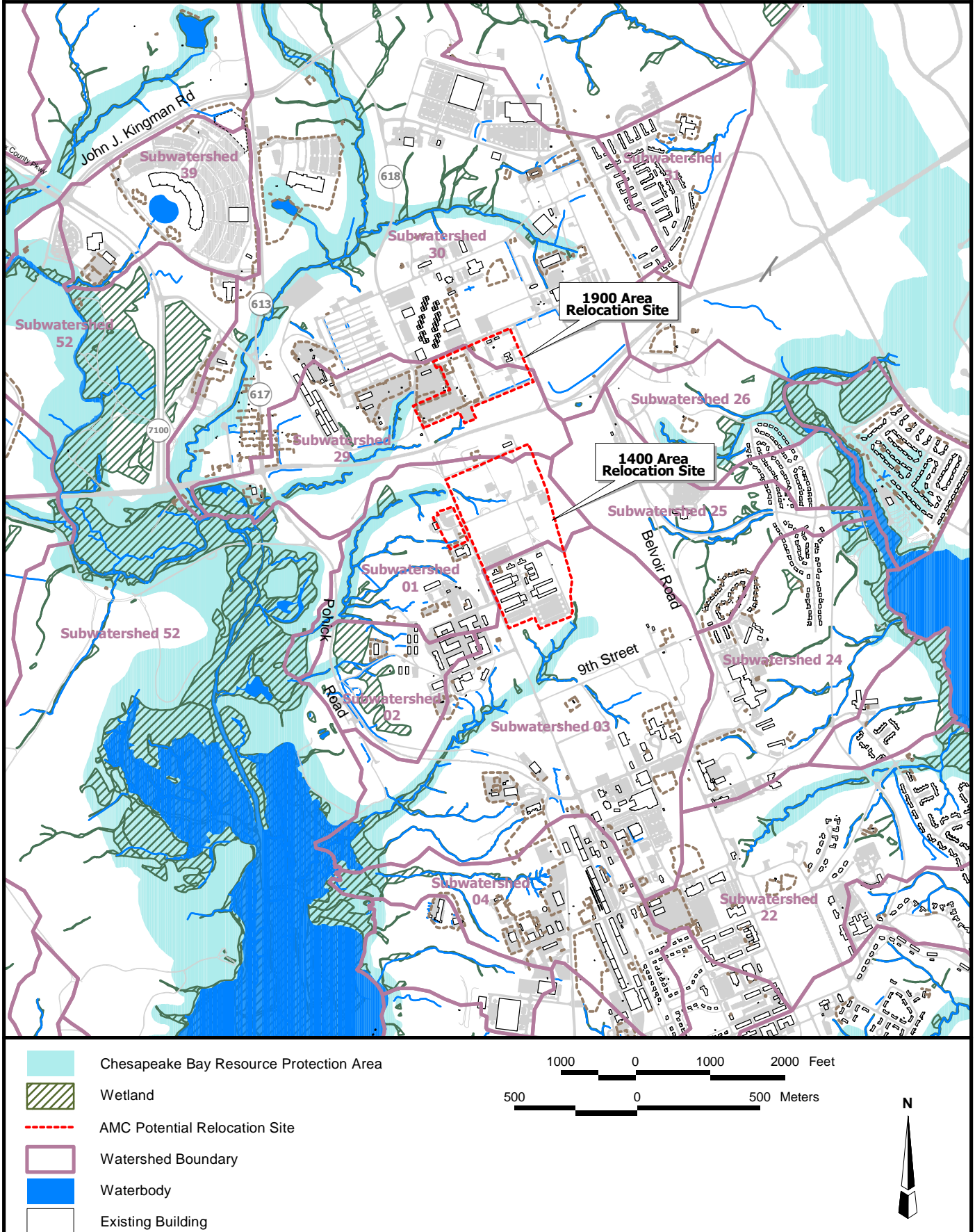
Wildlife is discussed in Subchapter 3.9.8 of the May 2001 EA.

1400 Area and 1900 Area Relocation Sites

Potential wildlife habitat at the 1400 area and 1900 area relocation sites is limited. The sites are almost completely developed, with the exception of the woodlot in the northeast corner of the 1400 area relocation site and the grass-shrub strip along the eastern edge of the site. The only species that can be expected to occur would be those that are highly tolerant of human disturbance. Such species include:

- Northern short-tailed shrew (*Blarina brevicauda*).
- Chipmunk (*Tamias striatus*).
- Eastern grey squirrel (*Sciurus carolinensis*).
- Eastern cottontail rabbit (*Sylvilagus floridanus*).
- Woodchuck (*Marmota monax*).
- Raccoon (*Procyon lotor*).
- Opossum (*Didelphis marsupialis*).
- Striped skunk (*Mephitis mephitis*).
- Red fox (*Vulpes fulva*).
- Feral cats (*Felis catus*).
- American crow (*Corvus brachyrhynchos*).

Environmental Protection Areas



Note: Wetland and RPA boundaries delineated by Paciulli, Simmons & Associates, Ltd., 1/24/00.

Figure 3-3

- American robin (*Turdus migratorius*).
- European starling (*Sturnus vulgaris*).
- House sparrow (*Passer domesticus*).
- Blue jay (*Cyanocitta cristata*).
- Northern black racer snake (*Coluber constrictor*).
- Eastern garter snake (*Thamnophis sirtalis*).
- Five-lined skink (*Eumeces fasciatus*).

The grass-shrub strip, in combination with woodlots within and adjacent to the site, support an assortment of birds. Year round there are bluebirds (*Sialia sialis*), titmice (*Parus bicolor*), chickadees (*Parus* spp.), towhees (*Pipilo erythrophthalmus*), nuthatches (*Sitta* spp.), cardinals (*Cardinalis cardinalis*), downy woodpeckers (*Picoides pubescens*), hairy red-belly woodpeckers (*Picoides villosus*), red-bellied woodpecker (*Melanerpes carolinus*), song sparrow (*Melospiza melodia*), brown thrasher (*Toxostoma rufum*), and other species. In the summer, the area has a variety of flycatchers, including the great crested (*Myiarchus crinitus*) and Acadian (*Empidonax virescens*) flycatchers, scarlet tanagers (*Piranga olivacea*), wood thrush (*Hylocichla mustelina*), catbirds (*Dumetella carolinensis*), among others. In the winter, additional species are present, including white-throated sparrow (*Zonotrichia albicollis*), juncos (*Junco hyemalis*), and yellow-rumped warblers (*Dendroica coronata*). A diverse selection of species can occur during spring migration, and, occasionally, red-shouldered hawk (*Buteo lineatus*) and probably owls hunt in this area.

3.9.9 Threatened and Endangered Species

Threatened and endangered species are discussed in Subchapter 3.9.9 of the May 2001 EA.

1400 Area and 1900 Area Relocation Sites

No occurrence of any protected species has been recorded on or adjacent to the 1400 area and 1900 area relocation sites. The Division of Natural Heritage of the Virginia Department of Conservation and Recreation (VDCR/DNH) and the US Fish and Wildlife Service (USFWS) were consulted for potential occurrences of federal or state rare, endangered or threatened species on the proposed relocation sites. VDCR/DNH indicated that its Biological and Conservation Data System documents the presence of natural heritage resources in the project area, but at a distance from the project sites (Mayne, May 20, 2002; letter in [Appendix A](#)).

3.10 Hazardous Substances

Hazardous substances are discussed in Subchapter 3.10 of the May 2001 EA.

Several former ASTs and USTs have been associated with buildings on both the 1400 area and 1900 relocation sites. Inactive ASTs have been removed. Generally, Fort Belvoir removes inactive USTs during demolition of associated buildings. However, occasionally inactive USTs have been left in place and abandoned.

Two existing ASTs are associated with the two empty buildings in the northern portion of the 1400 area relocation site. No active USTs remain on the 1400 area relocation site. Active ASTs are associated with Buildings 1918 and 1930 on the 1900 area relocation site.

4 IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter provides an assessment of the potential environmental impacts that would result from the Proposed Action, which consists of temporarily relocating 1,170 civilian, military, and contractor Headquarters AMC personnel from their current facility in Alexandria, VA, to Fort Belvoir, VA, as described in [Subchapter 2.2](#). Chapter 4 is organized similarly to Chapter 3. Subchapters 4.1 to 4.10 address the impacts on specific resources. Subchapters 4.11 to 4.16 address cumulative impacts and other NEPA requirements.

4.1 Land Use, Plans, and Coastal Zone Management Impacts

4.1.1 Land Use Impacts

4.1.1.1 No Action Alternative

Under the No Action Alternative, Headquarters AMC would not relocate to Fort Belvoir. Current land use patterns would remain unchanged.

4.1.1.2 Proposed Action

The Proposed Action would result in the conversion of about 19 acres (7.7 hectares) of landscaped area and open field that appear to have been used as building sites in the past, approximately 2 acres (0.8 hectares) of small trees and brush, and the demolition of an abandoned, existing building, comprising 11,400 sq ft (1,059 sq m) to use for temporary buildings, parking, and landscaped areas. The construction area would be adjacent to existing buildings and areas now mostly used for administrative purposes. Existing roads would be used to access the new modular buildings and parking facilities. Implementation of the Proposed Action would thus be consistent with existing land use patterns.

4.1.1.3 North Post Alternative

The North Post alternative would result in the displacement of landscaped area and open field. The construction area would be immediately adjacent to existing buildings, and, like the Proposed Action, the North Post alternative would use existing roads to access the new modular buildings and parking facilities. Implementation of this alternative would be consistent with existing land use patterns.

4.1.2 Impacts on Plans

4.1.2.1 No Action Alternative

The No Action Alternative would have no impact on existing plans.

4.1.2.2 Proposed Action and North Post Alternative

The National Capital Planning Commission would review the relocation project for consistency with the goals and recommendations contained in the Comprehensive Plan for the National Capital before any irreversible decisions regarding implementation of the Proposed Action or the North Post alternative were made.

The proposed relocation of elements of AMC to the 1400 area would be consistent with the Fort Belvoir master plan's expectation of increased administrative use for the northern portion of the South Post Planning District, within which the 1400 area relocation site is located. The master plan also allows administrative uses in the Lower North Post Planning District, where the 1900 area relocation site is located. The move of Headquarters AMC personnel there also would be fully compatible with this recommendation.

4.1.3 Impacts on Coastal Zone Management

4.1.3.1 No Action Alternative

The No Action Alternative would generate no impact that would require a permit from the core Commonwealth of Virginia regulatory programs pertinent to the Coastal Resources Management Program (CRMP). It would have no effect on coastal zone resources.

4.1.3.2 Proposed Action Alternative

The relocation of 1,170 personnel to temporary modular buildings at Fort Belvoir would be consistent to the maximum extent practicable with the Commonwealth of Virginia's CRMP enforceable policies:

Encroachment on Subaqueous Lands. There would be no impact on subaqueous lands.

Encroachments on Wetlands. There would be no impact to wetlands.

Air Pollution Control. An air quality analysis detailed in [Subchapter 4.5](#) and [Appendix A](#), indicates that emissions from construction and demolition activities would not exceed regional

de minimis levels and there would be no significant impact on regional air quality. A Clean Air Act General Conformity Record of Non-Applicability is included in [Appendix D](#).

Primary Sand Dune Management Program. No primary sand dunes occur in the proposed construction areas.

Fisheries Management. The proposed action would have no direct effects on finfish and shellfish resources.

Land Disturbing Activities Needing Erosion and Sediment Control. A Virginia Pollutant Discharge Elimination System (VPDES) permit would be required for this project because construction activities would disturb more than 5 acres (2 hectares) of land. Approximately 21 acres (8 hectares) of land, which includes old parking lots and one old building, would be disturbed for the proposed action. The proposed action would increase the impermeable surface of the 1400 relocation site by an estimated 10.9 acres (4.4 hectares) for buildings, parking lots, and sidewalks. Although the area is flat and runoff from the site would be minimal, control of temporary increases in discharge of sediment-laden runoff during construction would be included in construction plans and implemented during the construction process.

Point Source Pollution Control. The proposed action would discharge wastewater into the Fort Belvoir sewer system, which is connected to the Fairfax County wastewater system, and treated at the Noman J. Cole Jr. Pollution Control Plant.

Control of Septic and Other On-Site Domestic Waste Systems. The proposed action would not include the demolition or installation of septic tanks.

Coastal Lands Management. The proposed action would not disturb Chesapeake Bay RPAs. Stormwater likely would be collected and discharged to the existing stormwater systems on Fort Belvoir that were designed using best management practices and that meet Fairfax County requirements for the Chesapeake Bay RMA.

4.1.3.3 North Post Alternative

The impacts on the coastal zone of implementing this alternative would be similar to those described for the Proposed Action Alternative.

4.2 Socioeconomic Impacts

4.2.1 No Action Alternative

The No Action Alternative would require no relocation of personnel, would not induce changes in residence, and would not affect local or regional demographic or economic conditions.

4.2.2 Proposed Action and North Post Alternative

4.2.2.1 Fort Belvoir

The addition of 1,170 Headquarters AMC personnel to Fort Belvoir's approximately 21,240 current military and civilian employees would be an increment of about 5.5 percent. About seven percent of the relocating personnel would be military. Some of these military personnel live at Fort Belvoir now and commute to the Alexandria location. The military personnel relocated to Fort Belvoir would be eligible for military housing at the installation.

Waiting lists for housing range from six months for grades E1-E6, and up to 30 months for field officers. Thus, as these personnel apply for on-post housing, only a small number are likely to become eligible for this housing towards the middle/end of their first three-year tour in the National Capital Region. Consequently, the majority of the military personnel are likely to seek their housing off the installation. There are no plans to add to the supply of military housing at Fort Belvoir. Civilian personnel would continue to find housing in the community.

4.2.2.2 Fairfax County and the Region

As indicated by the traffic analysis, under the Proposed Action, the average commuting distance to work for AMC and co-located activities employees would decrease from approximately 18.7 mi (30.1 km) each way to 18.3 mi (29.4 km) each way. In particular, those employees who currently live south of Fort Belvoir and drive by it on their way to the Alexandria facility (about 37 percent of all employees) would see their daily commute significantly shortened, with all the quality-of-life benefits that come from spending less time on the road to work and more time at home. Conversely, the commutes of some personnel would become longer, but on average not by so much (Alexandria and Fort Belvoir are only about 11 mi [18 km] apart) that the difference in commuting distance would induce a significant number of employees to move their residences. Given people's natural reluctance to move, employees who already make fairly lengthy commutes to Alexandria are for the most part likely to continue to be willing to make fairly lengthy commutes to work.

This is especially true of current military employees. Most of the military personnel rotate into AMC for one or two three-year tours. Thus, military personnel may perceive less of an incentive

to move their residences than permanent civilian employees. However, by 2004, many relocating military personnel will have moved on to new posts and been replaced by new individuals. Although 1) at least some of those new personnel are likely to come from the National Capital Region, and 2) at least some of the employees they replace are likely to move out of the region, for purposes of the present analysis, it is conservatively assumed that the new military personnel and their households represent a net gain for the region. Even if all of them settled in Fairfax County, which is unlikely, this would represent a negligible addition to its approximately 353,000 households. In conclusion, although relocating employees with the longest commutes may decide to move their residences closer to Fort Belvoir – to Fairfax County in particular – and some new military employees may settle into the county as they rotate into AMC, the impacts of those few moves on a jurisdiction that has a population of almost a million individuals would be insignificant.

4.2.2.3 Alexandria Site

Independent businesses located in and near the leased building now occupied by AMC and co-located activities could be negatively affected if, when AMC moves out, there is a gap before other tenants fill the building. The coffee shop, deli, hairdresser, federal credit union, staffing services, and cleaners located in AMC's building and other businesses nearby that appear to rely on AMC (particularly, staffing services, and space leased to the AMC Corporate Fitness Center and US Total Personnel Command warehouse) could be negatively affected in the short-run. Because AMC is relocating to a military installation, most of these businesses could not move with them. Negative effects would be tempered somewhat by AMC's phased move, so that the building would not empty suddenly, and there would be time for other tenants to move in. Also, the two new buildings under construction across from AMC's current building likely would alleviate some of the negative effects by providing sources of new customers.

4.2.2.4 Executive Orders 12898 on Environmental Justice and 13045 on the Protection of Children

Signed on February 11, 1994, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs all federal departments and agencies to incorporate environmental justice considerations in achieving their mission. Each federal department or agency accomplishes this by conducting programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude communities from participation in, deny communities the benefits of, nor subject communities to discrimination under such actions because of their race, color, or national origin.

Demographic and economic information on the potentially affected area was provided in [Subchapter 3.1](#) of the EA. As evaluated in accordance with Executive Order 12898, the direct and indirect effects of the Proposed Action would not cause adverse environmental or economic impacts specific to any groups or individuals from minority or low-income populations residing

in the study area, nor would any persons be displaced as a result of implementation of the Proposed Action.

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was signed on April 21, 1997. Because the scientific community recognized that children may suffer disproportionately from environmental health and safety risks, each federal agency is directed to identify and assess such risks, and consequently to ensure that its policies, programs, activities, and standards address effects on children. “Environmental health and safety risks” are defined as “risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest.” Covered regulatory actions that are affected by this EO are those substantive actions that concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children. The Proposed Action would not disproportionately affect children.

4.3 Impacts on Community Facilities and Services

4.3.1 No Action Alternative

Under the No Action Alternative, there would not be any change in demand for public services.

4.3.2 Proposed Action and North Post Alternative

4.3.2.1 Fort Belvoir

The addition of approximately 1,170 military and civilian AMC personnel to Fort Belvoir would not increase its residential population. Therefore, increased use of Fort Belvoir’s facilities would be limited to those facilities likely to be used by the influx of new workers. AMC’s military personnel would be likely to make increased use of services such as the commissary, the Post Exchange, liquor store, gas stations, and the credit union because of their proximity. Use of recreational facilities likely would increase slightly. In particular, more people may want to utilize the natural areas of Fort Belvoir that are currently developed for recreational uses, as described in [Subchapter 3.3.3](#) of the EA. Such increase is not expected to significantly affect these resources if funding for personnel and maintenance remains on a par with use levels.

Military personnel in Northern Virginia already are assigned to DeWitt Army Community Hospital and its four community-based primary care clinics. Military personnel would continue to use them, but might be more likely to shift to the main DeWitt facility because of its proximity to their place of work. Military personnel also might use the athletic, sport, and recreation facilities at Fort Belvoir more often because those facilities would be near their workplace. No

adverse impacts on these services and facilities are anticipated because the increase in numbers of military personnel is small in relationship to the total use of the facilities.

4.3.2.2 Fairfax County

The transfer of AMC personnel to Fort Belvoir is expected to generate at most a very small net relocation of personnel and their households to Fairfax County. Where these households would locate is unknown and would depend largely on availability and affordability of housing throughout the county. It is unlikely, however, that all the new households associated with the transfer would concentrate in one particular area. Consequently, increase in demand for services such as schools, fire, and rescue is likely to be very modest in any given area.

The addition of a small number of households, some with school-age children distributed among different grades, is unlikely to have any significant impact on the Fairfax County school system. The school system has an enrollment of more than 160,000 students and is already expecting growth to more than 174,000 over the next few years. Similar minimal impacts would be expected for other community services, such as police, fire, or medical services. Similarly, what is true for Fairfax County would also be true for the region at large.

4.4 Transportation and Traffic

4.4.1 No Action Alternative

Under the No Action Alternative, there would be no change in place of employment for AMC employees. The No Action Alternative travel patterns were examined for the year 2003. This alternative forms the basis against which other alternatives are evaluated.

4.4.1.1 No Action Alternative Traffic Volumes

The No Action Alternative estimates for traffic volumes include increases in background traffic projected from when data on existing conditions were collected (March 2002) to the year 2003. No new development projects are planned outside Fort Belvoir that could be expected to increase background traffic within the same time period.

To approximate the growth in through traffic from existing conditions to 2003, existing through traffic volumes were increased by 1½ percent per year for one year. A summary of the No Action traffic volumes is included in [Appendix B](#).

4.4.1.2 No Action Alternative Level of Service

A traffic operational analysis was conducted for each of the same study intersections analyzed for the existing conditions. Summaries of the intersection LOS for the No Action Alternative in the year 2003 are shown in [Tables 4-1](#) (signalized intersections) and [4-2](#) (unsignalized intersections). With the relatively small increases in traffic to 2003, the levels of service for the No Action Alternative are not significantly different from those for the existing conditions scenario. The intersections over capacity under the No Action Alternative are the same as for the existing conditions scenario; namely:

- Fairfax County Parkway and Kingman Road in the PM peak hour.
- US Route 1 and Fairfax County Parkway in both peak hours.
- US Route 1 and Backlick/Pohick Roads in the PM peak hour.

4.4.1.3 Transit Performance Assessment

As indicated in an earlier section, ridership on Fairfax Connector Route 202 has decreased since September 11, 2001. If the route were to return to its previous annual rate of growth (three to five percent per year), the route would still be carrying fewer riders in 2003 than it did in the pre-September 11 time frame. Thus, if the service reduction proposal is not implemented, adequate capacity will exist in 2003 under a No Action alternative.

4.4.2 Proposed Action

4.4.2.1 AMC Employee Travel Patterns

This section defines the likely travel patterns of the AMC employees to Fort Belvoir and develops trip generation information used in determining the impacts of the relocation. The current residential locations of AMC employees moving to Fort Belvoir are concentrated around Dulles International Airport but are also distributed around the region. The AMC offices at 5001 Eisenhower Avenue in Alexandria are about 11 mi (18 km) from Fort Belvoir, depending upon the route selected.

A zip code database for the residences of the AMC employees relocating to Fort Belvoir was used to establish employee travel patterns; zip codes for 995 AMC employees were analyzed (AMC, 2001). The zip codes were summarized, and access corridors to Fort Belvoir were determined based on the regional roadway network linking the residence locations and Fort Belvoir. For this study, with a 2003 horizon year for the relocation, it was assumed that employees would not have relocated their residences by the time of the move. A summary of the access corridors used in this study is summarized in [Table 4-3](#). The heaviest used access corridor

Table 4-1

Signalized Intersection Levels of Service – No Action Alternative

Signalized Intersections	AM		PM	
	V/C Ratio	Capacity Status	V/C Ratio	Capacity Status
Fairfax County Pkwy/Kingman Road	0.77	Under Capacity	1.39	Over Capacity
Route 1/Fairfax County Parkway	1.04	Over Capacity	1.11	Over Capacity
Route 1/Backlick Rd/Pohick Rd	0.71	Under Capacity	1.07	Over Capacity
Route 1/Belvoir Road	0.81	Under Capacity	0.72	Under Capacity
Route 1/Woodlawn Road	0.60	Under Capacity	0.73	Under Capacity
Gunston Road/Pohick Road/12 th Street	0.37	Under Capacity	0.52	Under Capacity
Source: TransCore, 2002.				

Table 4-2

Stop-Controlled Intersection Levels of Service – No Action Alternative

Stop-Controlled Intersections	AM		PM	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Belvoir Road/9 th Street	C	23.8	D	29.5
Gunston Road/9 th Street	B	12.1	B	11.4
Source: TransCore, 2002.				

Table 4-3

AMC Access Corridors to Fort Belvoir

Access Corridor	Trips	Distribution
US Rt 1 (from South)	369	37.1%
US Rt 1 (from North)	211	21.2%
Fairfax County Pkwy	302	30.3%
Telegraph Rd/Beulah St. (from North)	105	10.6%
Fort Belvoir (Local Traffic)	8	0.8%
Total	995	100.0%
Source: TransCore, 2001.		

is expected to be Route 1 from the south with 37 percent of the AMC employees projected to use that facility to access Fort Belvoir. An additional 30 percent are expected to use the Fairfax County Parkway from the northwest and 21 percent are projected to use Route 1 from the north.

Based on data indicating the home location of AMC personnel by zip code, the vehicle miles traveled daily from home-to-work and return for the commuting trip to the Eisenhower Avenue site and to Fort Belvoir were calculated. Today, the vehicle miles traveled for 1,000 employees driving from home to AMC offices on Eisenhower Avenue is estimated to be 37,400 (60,180 vehicle kilometers). For the trip from home to Fort Belvoir, the trip is estimated to generate 36,505 vehicle miles (58,737 vehicle kilometers) traveled, an actual decrease of 895 vehicle miles (1,440 vehicle kilometers) traveled, or a decrease of about 2.4 percent. This small decrease in vehicle miles traveled is primarily explained by the 37 percent of AMC employees who live to the south of Fort Belvoir and commute past Fort Belvoir daily to their work location on Eisenhower Avenue.

In 2000, all traffic in and out of the McNamara Headquarters Complex was counted for three hours during the morning peak period and three hours during the afternoon peak period. These data were used to provide complete information on the number of trips to and from the headquarters complex for the main entry and exit periods of the day. For this study, it has been assumed that the trip generation rates (number of trips per employee) are comparable for the McNamara Headquarters Complex and AMC employees. The results of the study at the McNamara Headquarters Complex found a trip generation rate of 0.310 total trips per person (0.293 inbound and 0.017 trips outbound during the morning peak hour. Similarly, in the evening

peak hour, a trip generation rate of 0.276 total trips per person was calculated (0.019 trips per person inbound and 0.257 trips per person outbound).

The unit rates for trips to and from the McNamara Headquarters Complex were applied to the AMC population being relocated to Fort Belvoir. This resulted in an approximation of the number of trips this relocation would add to the roadway network in the vicinity of Fort Belvoir. The relocation of 1,350 employees to the 1400 area of South Post would generate a total of 419 new trips in the morning peak hour and 373 in the afternoon peak hour. This information is summarized in [Table 4-4](#).

Table 4-4
Estimated Trip Generation for AMC

Peak Hour	Inbound	Outbound	Total
AM Peak Hour			
Trip Generation Rate	0.293	0.017	0.310
AMC Trips	396	23	419
PM Peak Hour			
Trip Generation Rate	0.019	0.257	0.276
AMC Trips	26	347	373
Source: TransCore, 2002.			

The AM and PM peak hour trips that would be made by AMC personnel is an estimate based on current McNamara Headquarters employee tripmaking patterns. These data indicates that the commuting trips are spread throughout the three-hour morning and evening peak hours, and reflect flexible working hours. There also appears to be a significant amount of ridesharing activity, given that 3,100 employees at the McNamara Headquarters site only generated 2,218 trips in the 3-hour morning peak period and 1886 in the 3-hour evening peak period. This pattern hopefully is to be repeated by AMC personnel, operating under similar personnel policies.

4.4.2.2 Proposed Action Traffic Volumes

The Proposed Action traffic volumes were derived from the No Action Alternative's traffic volumes by assigning the trips generated by the 1,350 AMC employees to the roadway network based on approach routes and paths to their destinations on Fort Belvoir. A summary of the Proposed Action traffic volumes is included in [Appendix B](#).

4.4.2.3 Proposed Action Level of Service

A traffic operational analysis was conducted for each of the same intersections analyzed for existing conditions and for the No Action Alternative. Projected intersection levels of service are summarized in [Tables 4-5](#) and [4-6](#). The following intersections are projected to be over capacity for the Proposed Action:

- Fairfax County Parkway and Kingman Road in the PM peak hour.
- US Route 1 and Fairfax County Parkway in both peak hours.
- Route 1 and Backlick/Pohick Roads in the PM peak hour.
- Belvoir Road and 9th Street the PM peak hour for the eastbound left turn movement.

The Proposed Action would have an adverse impact on traffic at three of the four locations noted above, where an adverse traffic impact is defined as a condition that increases a volume/capacity ratio by more than five percent. The only location not requiring mitigation is at Route 1 and the Fairfax County Parkway. This intersection is over capacity for both the existing conditions and No Action Alternatives, but the increase from the No Action to Action Alternatives is less than the threshold requiring mitigation.

4.4.2.4 Proposed Mitigation Measures

The following measures are recommended to mitigate the impacts of the AMC relocation to Fort Belvoir. Each mitigation measure is discussed in detail below.

- Fairfax County Parkway and Kingman Road – Adding a second westbound Kingman Road right turn lane would mitigate the impacts of the AMC relocation. However, opening of Beulah Street south of Telegraph Road to Fort Belvoir traffic also would mitigate these impacts.
- US Route 1 and Backlick Road/Pohick Road – Open the Lieber Gate to right turn exiting traffic during the evening peak period.
- Belvoir Road and 9th Street – Signalize the intersection or, in lieu of signalization of the intersection, open the ramp from Gunston Road to northbound Route 1 during the evening peak period.

Fairfax County Parkway and Kingman Road

The intersection of Fairfax County Parkway and Kingman Road is projected to operate “Over capacity” with a v/c of 1.39 in the evening peak hour. The impact of the relocation of AMC to

Table 4-5

Signalized Intersection Levels of Service
Proposed Action - 2003

Signalized Intersections	AM		PM	
	V/C Ratio	Capacity Status	V/C Ratio	Capacity Status
Fairfax County Pkwy/Kingman Road	0.82	Under Capacity	1.49	Over Capacity
Route 1/Fairfax County Parkway	1.05	Over Capacity	1.14	Over Capacity
Route 1/Backlick Rd/Pohick Rd	0.78	Under Capacity	1.14	Over Capacity
Route 1/Belvoir Road	0.87	Near Capacity	0.78	Under Capacity
Route 1/Woodlawn Road	0.63	Under Capacity	0.73	Under Capacity
Gunston Road/Pohick Road/12 th Street	0.44	Under Capacity	0.67	Under Capacity
Source: TransCore, 2002.				

Table 4-6

Stop-Controlled Intersection Levels of Service
Proposed Action - 2003

Stop-Controlled Intersections	AM		PM	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Belvoir Road/9 th Street	D	30.2	F	58.7
Gunston Road/9 th Street	C	19.0	B	12.2
Source: TransCore, 2002.				

Fort Belvoir is to increase the v/c to 1.49. The major movement contributing to this high v/c ratio is the westbound Kingman Road right turn to northbound Fairfax County Parkway.

Using the operational analysis methodology of the *Highway Capacity Manual* the intersection is projected to operate at LOS F for both the No-Action and Action scenarios. The average delay per vehicle is projected to increase from 128 seconds under the No Action to 153 seconds for the Action scenario. A proposed mitigation measure is the addition of a second westbound right turn lane to accommodate the 1,270 right turning vehicles ([Appendix B Table B-3, PM Peak Hour](#)) projected for the Action scenario. Addition of a second right turn lane would reduce the average vehicle delay to 61 seconds (or considerably less than the 128 seconds projected under the No Action alternative).

An alternative mitigation would be to open Beulah Street south of Telegraph Road to Post traffic. This alternative would divert approximately 500 vehicles from the westbound Kingman Road right turn lane to the Beulah Street approach to Telegraph Road. This opening of Beulah Street would reduce the right turn traffic volume in the evening peak hour at Kingman Road to a level significantly lower than found under existing conditions. Therefore, no further mitigation would be required for this location.

US Route 1 and Backlick Road/Pohick Road

This intersection is projected to operate “Over Capacity” with a v/c ratio of 1.07 in the evening peak hour for the No Action alternative. This v/c is projected to increase to 1.14 with the relocation of AMC to the post. The major movement contributing to this high v/c is the northbound left turn from Pohick Road to westbound US Route 1.

Under the operational analysis methodology of the *Highway Capacity Manual*, the intersection would operate at LOS F in the evening peak hour for both the No Action and Action alternatives. The average vehicle delay would increase from 120 seconds under the No Action to 157 seconds for the Action scenario.

Any proposed physical improvements to the intersection would be difficult to achieve. While it may be possible to add a third northbound left turn lane, such an addition also requires the addition of a third lane westbound on US Route 1 to accept the three lanes of turning traffic. Providing the third lane on Route 1 is problematic due to right of way issues along the north side of US Route 1.

The proposed mitigation for this intersection is the opening of the Lieber Gate on Constitution Road as an alternative route to accessing US Route 1 to the west. It is proposed that the Lieber Gate be opened for right turn only exiting vehicles during the evening peak period. This would provide a connection for AMC traffic in the 1400 area to leave the post by traveling northbound on Gunston Road and then eastbound on Meade Road to Constitution Road and the Lieber Gate.

Such a mitigation measure would provide an alternative for traffic to access US Route 1 westbound without using the Tulley Gate and Pohick Road.

The opening of the Lieber Gate would reduce the traffic demands on the Pohick Road approach to the intersection and move that traffic to the westbound lanes of US Route 1. This change would reduce the Proposed Action average vehicle delay for the intersection from 157 seconds to 123 seconds. This is just three seconds more than the delay under the No Action alternative.

Belvoir Road and 9th Street

The intersection of Belvoir Road and 9th Street is currently unsignalized. The eastbound left turn from 9th Street to northbound Belvoir Road is the key movement and it is projected to operate at LOS D under the No Action alternative. However, the LOS would be degraded to LOS F with the additional AMC traffic in the Proposed Action scenario. This AMC traffic is destined to the US Route 1 corridor to the east and north.

Two alternatives are available to mitigate the impacts of the AMC traffic. One would signalize the intersection. Such an improvement would result in a LOS A for the intersection (compared to a LOS D under the No Action Alternative). A second and preferred alternative would open the ramp from Gunston Road to northbound Route 1 during the evening peak period. This second alternative would provide a preferred route for AMC traffic between the 1400 Area and the Route 1 corridor to the east and north. Opening of this ramp would remove AMC traffic from the critical eastbound left turn movement at the intersection of Belvoir Road and 9th Street and obviates the need for mitigation at the intersection.

4.4.2.5 Transit Performance Assessment

Under the 2003 Proposed Action, there would be an increase of 1,350 employees in the 1400 area of the South Post. The most detailed ridership counts conducted at Fort Belvoir over the past several years have been at the McNamara HQC. Those counts have indicated a two-percent mode share for public transit. Comparing the amount of service provided to the McNamara HQC with that provided to other areas of Fort Belvoir would indicate that the two-percent figure represents a current upper limit for transit ridership to other areas of the post.

Assuming two percent of the AMC employees utilize transit, this represents a maximum increased transit demand of 27 riders per day to and from the 1400 area. With six AM peak period and six PM peak period trips operated on Route 202, the increased riders represent fewer than five additional riders per trip. Adequate capacity exists on the route to handle this increase. At the same time, it is probably unlikely that this level of additional ridership would be sufficient to warrant the continuation of service to the 1400 area should the county proceed with its proposal to reduce service on the route.

4.4.3 North Post Alternative

The impacts of the North Post Alternative on transportation and traffic are expected to be the same as those for the Proposed Action. The travel paths of employees to the two sites are not expected to differ to any significant extent, as the two sites are adjacent to each other on Gunston Road with no intersections between the two relocation sites. During the evening peak period, the impact on the congested Fairfax County Parkway/Kingman Road intersection also would be the same under both siting alternatives.

Similarly, the proposed measures for mitigating the impacts of the Proposed Action also would be effective in alleviating the impacts of the North Post Alternative. Opening Leiber Gate in the evening from 3:30 to 6:30 would enable commuters wishing to go south on US Route 1 to leave the post almost directly from the 1900 area to US Route 1 south.

4.4.4 Transportation Management Plan

Fort Belvoir is served by the northern Virginia regional freeway and arterial transportation network, many sections of which are congested during both peak periods. In addition, the installation does not have unlimited space available to park employee vehicles. These two factors, limited highway capacity and limited parking, suggest the need for a program that minimizes highway travel and maximizes the use of other travel modes. The strategies of such a program are discussed below. The first section involves recommendations to improve transit service. It is followed by transportation management measures that should be considered by Fort Belvoir.

4.4.4.1 Improve Existing Transit Service

Transit mode shares of ten percent or higher are found in some areas of the Route 1 corridor in Fairfax County that are convenient to the regional rail transit network. This contrasts with a maximum of two percent that utilizes public transit at Fort Belvoir, based on surveys conducted over the past several years. Transit usage at the 1400 area of South Post is unlikely to approach this level due to the location of the site relative to the regional rail transit network. However, the level of transit usage could be increased through the implementation of a number of steps designed to improve the attractiveness and convenience of public transportation service.

While the 1400 area is currently served by transit, many of the buildings within this area are not located within a convenient distance of a bus stop. This is one of the factors that has probably contributed to the relatively low levels of ridership to and from Fort Belvoir, putting the continuation of certain existing services at risk. Accessibility to the existing transit service needs to be considered in planning facilities at Fort Belvoir if transit usage is to be maximized. This

includes ensuring convenient pedestrian access between the buildings and the existing bus stops and possible provision of additional passenger amenities such as bus shelters at the stops. Discussions should take place between post personnel and staff from the operator of the transit service (Fairfax County) relative to the addition of new bus stops.

Another option for increasing the convenience and attractiveness of public transit service at Fort Belvoir is the initiation of a feeder bus route connecting the post to the nearest Metrorail station (Franconia-Springfield) during the mid-day period as well as during the peak periods. While two of the existing routes serving Fort Belvoir (Routes 202 and 304) currently provide a connection to the Franconia-Springfield Metro station, they do not necessarily operate at the times that are most convenient for post personnel and they do not provide mid-day service. The lack of mid-day service is often a major deterrent to transit usage, as potential riders are concerned about their inability to return home during the day in case of emergency or illness.

In relation to the AMC relocation, it is unlikely that additional feeder bus service between Fort Belvoir and the Franconia-Springfield Metro station could be justified simply on the basis of the additional personnel to be relocated to the 1400 area. Such a service could only be justified on the basis of providing service to the broader post community including the McNamara HQC and other North and South Post locations. Furthermore, given the laws and regulations barring Fort Belvoir from entering into a purchase of service contract to provide such a service, the existing public transit operators would need to be involved in the provision of this service. Thus, it is important that any plans for expanded feeder service be part of a broader transit plan for the Fort Belvoir area and be coordinated with the recently completed Route 1 Corridor Transit Study and WMATA's Regional Bus Study.

In general terms, pending the completion of a comprehensive Fort Belvoir Mass Transit Study within the current calendar year, the trip from the Franconia-Springfield Metro station to the 1400 area is estimated to take approximately 20 to 25 minutes operating primarily via the Fairfax County Parkway, Telegraph Road, the Franconia-Springfield Parkway and Beulah Street. The exact time would depend upon the routing through the North Post and which locations are to be served along the way. While these times would be only slightly less than the amount of time currently required via the current Fairfax Connector route, a feeder route specifically targeted at the Fort Belvoir market could be scheduled to meet specific work hours, thereby making the service more attractive to potential users. Depending upon the exact sites to be served, two vehicles would be required to provide service on a 20 to 30 minute frequency.

By thus being able to provide service more directly to the work sites and having the flexibility to tailor the schedule to the specific needs of the workforce, it is likely that the use of public transportation could be increased over what is currently being experienced at Fort Belvoir. Based upon experiences elsewhere, transit utilization rates for the AMC relocation of from three to five percent might be achievable at the 1400 area of South Post, depending upon the origins and demographic profiles of the potential transit riders.

4.4.4.2 Complete a Comprehensive Mass Transit Study

Fort Belvoir is currently in the process of finalizing plans for a mass transit study of the entire post. Plans are to complete the study by the end of the current calendar year. Fort Belvoir should vigorously pursue this study and complete it in a timely manner. The study will collect data on existing commuter patterns, analyze the data to identify problems and opportunities, and investigate potential feasible options for high quality transit/rideshare opportunities available to the Post.

4.4.4.3 Continue and Improve the Transportation Coordination Office

Fort Belvoir currently has an established position of Transportation Coordinator/Manager. This office should be continued and expanded, as necessary, to meet the goal of coordinating, administering, and enforcing the Transportation Management Program (TMP) strategies and to promote travel modes to the post other than single-occupant vehicles. AMC should actively participate in and support the Transportation Coordination Office. The office should supply information to employees post-wide on the various TMP programs and on transit and ridesharing services. It should also administer a ridesharing database and information matching system for AMC.

4.4.4.4 Establish a Personalized Rideshare Matching Service

The goal of such a program is to minimize single-occupant vehicle trips to Fort Belvoir. Slight increases in the average vehicle occupancy would result in substantial reductions in total vehicle trips. This program would be administered by the Transportation Coordinator/Manager. The program would provide information on, and aggressively promote, ridesharing, and maintain a database and information matching service.

4.4.4.5 Promote the Use of Telecommuting, Staggered Work Hours, Flextime, and Nine-day, Bi-weekly Work Schedule

The goal of this program is to limit travel to Fort Belvoir, especially during peak commuter periods. At the present time, a considerable amount of travel to Fort Belvoir takes place outside of the peak hours. Telecommuting, at least during a portion of the workweek, is becoming an accepted practice and should be encouraged where practical. In addition, staggering of work hours is a normal practice. There is potential for further benefits in this area. Fort Belvoir employees should be encouraged to schedule their work trips outside the 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM time periods. Use of a nine-day bi-weekly work schedule would reduce both traffic volumes and the need for parking spaces. While not possible for all employees, it may offer an opportunity for reduced travel by a portion of the AMC population.

4.4.3.6 Continue the Transit Discount Program

Fort Belvoir currently has a transit discount program in place. The goal of this program is to provide additional incentive for employees to use an alternate mode of transportation. This transit discount program should be continued and promoted throughout the post.

4.5 Air Quality Impacts

The air quality analysis for the Proposed Action and the No Action Alternative includes:

- A microscale CO analysis of potential impacts on local traffic, using the modeling procedures described in [Subchapter 3.5](#).
 - A Clean Air Act General Conformity applicability analysis of direct and indirect emission increases that would result from the Proposed Action.
-

4.5.1 No Action Alternative

Mobile Sources

The results of the microscale air quality analysis for the No Action Alternative (year 2002) indicate that CO levels would be about the same as those predicted under existing conditions ([Table 4-7](#)). The analysis shows no violations of the one-hour CO standard of 35 ppm or the eight-hour standard of 9 ppm.

Stationary Sources

Under the No Action Alternative, air pollutant emissions associated with the Proposed Action would not occur and emissions at Fort Belvoir would remain at current levels. Thus, the No Action Alternative would not affect current air quality conditions.

4.5.2 Proposed Action

Mobile Sources

The microscale CO modeling indicates that CO levels under the Proposed Action, with or without the traffic mitigation plan described in [Subchapter 4.4.2.4](#), would be slightly higher than under the No Action Alternative, since the Proposed Action would increase local traffic.

Table 4-7

Worst-Case CO Levels - No Action Alternative and Proposed Action

Location	One-Hour Concentration (ppm)		Eight-Hour Concentration (ppm)	
	No Action Alternative	Proposed Action	No Action Alternative	Proposed Action
US Route 1 and Backlick/Ft. Belvoir Roads	9.6	9.7	5.5	5.6
J.J. Kingman Road and Fairfax County Parkway	9.2	10.0	5.2	5.8
Notes: CO levels include background concentrations of 6.0 ppm (1-hour) and 3.0 ppm (8-hour). NAAQS CO one-hour standard is 35 ppm; the eight-hour standard is 9 ppm.				

However, the results of the microscale CO levels indicate that the Proposed Action would cause no violations of either the one-hour or the eight-hour CO standard. The predicted worst-case CO concentrations are presented in [Table 4-7](#).

Stationary Sources

Following implementation of the Proposed Action, the temporary buildings would be expected to be heated using a number of electric heaters for space heating. Therefore there would be no net increase in stationary source emissions on the post.

Construction Activities

Construction activities would cause short-term air quality impacts, as follows:

- Fugitive dust would be generated during construction operations. Adherence to local ordinances, in combination with the application of water to control dust and periodic street sweeping and/or wetting down of paved roadway surfaces, would aid in preventing fugitive dust generated by construction activities from becoming airborne.
- Construction activities would cause emission of VOCs and NO_x, which are precursors of O₃. Such activities would include:
 - Use of construction equipment;
 - Movement of trucks containing construction materials;
 - Use of paving equipment; and
 - Commuting of construction workers.

Clean Air Act Conformity

The following general conformity rule analysis was conducted according to the guidance provided by the USEPA in *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (November 1993). Under the general conformity rule, reasonably foreseeable emissions associated with all operational and construction activities, both direct and indirect, must be quantified and compared to the annual *de minimis* levels for those pollutants in nonattainment for that area. Since the proposed action would result in increases in emissions due to construction activities, the general conformity rule analysis was conducted and is detailed in [Appendix C](#). For a serious ozone nonattainment area, such as where Fort Belvoir is located, the *de minimis* criterion is 50 tons per year (tpy) (45 metric tpy) for both VOCs and NO_x.

Construction Activity Emissions

Increased VOC and NO_x emissions from proposed construction activities would result from the following potential activities:

- Use of construction equipment.
- Movement of trucks containing construction materials.
- Construction workers commutation.

Estimates of construction equipment emissions ([Table 4-8](#)) were based on the estimated hours of use and emission factors for each motorized source. Emission factors for NO_x and VOCs related to heavy-duty diesel equipment were obtained from a report entitled *Non-road Engine and Vehicle Emission Study* (USEPA, 1991). Emission factors for NO_x and VOCs related to delivery trucks and the vehicles of construction workers were estimated using the USEPA Mobile5b computer model. The equipment and vehicle operation hours are estimated based on Means (2000) and field experience from similar projects. The detailed methodologies used in calculating construction emissions are presented in [Appendix C](#).

Conformity Applicability Determination

Under the general conformity rule, total emissions resulting from proposed federal actions must be compared to the applicable *de minimis* levels on an annual basis. As defined by the general conformity rule, if the emissions of a criteria pollutant (or its precursors) do not exceed the *de minimis* level, the federal action has minimal air quality impact, and therefore, the action is determined to conform for the pollutant under study and no further analysis is necessary. Conversely, if the total direct and indirect emissions of a pollutant are above the *de minimis* level, a formal general conformity determination is required for that pollutant.

Table 4-8
Proposed Action
Total Emissions Levels

Activity	Year	Emission Source	Pollutant (tons/year)	
			VOC	NO _x
Construction	2002	Equipment	0.25	2.62
		Motor Vehicles	0.20	0.84
Total Annual Emissions (Year 2002)			0.45	3.46
De Minimis Levels			50	50

As shown in [Table 4-8](#), the annual emission values under the Proposed Action would not exceed the *de minimis* criteria of 50 tpy (45 mtpy) of VOCs or NO_x. Therefore, a formal conformity determination is not required and potential air quality impacts would not be significant. The *Final State Implementation Plan Revision, Phase I Attainment Plan* (MWCOG, 1997) sets forth daily target levels of 362.9 tpd (329 metric tpd) of VOCs and 637.1 tpd (578 metric tpd) of NO_x for the metropolitan Washington ozone nonattainment area (which includes Fairfax County). The increase in annual emissions would not make up ten percent or more of the available regional emission inventory for VOCs or NO_x and would not be regionally significant. The Record of Non-Applicability is provided in [Appendix D](#).

4.5.3 North Post Alternative

Under the North Post Alternative, the number of people to be relocated to Fort Belvoir, the size of the new buildings, and the scale of construction are expected to be the same as compared to the Proposed Action. Therefore, the potential air quality impacts under the North Post Alternative would be the same as the Proposed Action.

4.6 Noise Impacts

4.6.1 No Action Alternative

Under the No Action Alternative, there would be no change in activities at Fort Belvoir. Noise conditions in the project area would remain the same as under existing conditions.

4.6.2 Proposed Action

Human response to changes in noise levels depends on many factors, including the quality of sound, the magnitude of the change, the time of day at which the changes take place, whether the noise is continuous or intermittent, and the individual's ability to perceive the changes. Noise levels are typically expressed in terms of decibels (dB). Decibels are a logarithmic expression of sound energy. Frequency weightings have been developed to more closely duplicate the human hearing response. A-weighted decibels, or dBA, are the weighting network most often applied to traffic noise evaluations.

Human ability to perceive changes in noise levels varies widely with the individual, as does response to the perceived changes. However, the average ability of an individual to perceive changes in noise levels is well documented, and is shown in [Table 4-9](#). Generally, a three-dBA or smaller change in noise level would be barely perceptible to most listeners but a five-dBA level would be readily noticeable. A 10-dBA change is normally perceived as a doubling (or halving) of noise levels. These thresholds permit estimation of an individual's probable perception of changes in noise levels.

Table 4-9

Average Ability to Perceive Changes in Noise Levels

Change in Decibels (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A dramatic change
40	Difference between a faintly audible sound and a very loud sound
Source: Federal Highway Administration, 1995.	

The increase in traffic noise due to the Proposed Action can be determined based on the proportional increase in traffic (on a logarithmic basis) associated with the project. For instance, a doubling of traffic volumes would result in a three-dBA increase in noise level, which is a barely perceptible increase. Based on the traffic analysis described in [Subchapter 4.4](#), future traffic volumes at or near Fort Belvoir during peak-hour conditions under the Proposed Action are unlikely to be twice those expected under the No Action Alternative. Therefore, noise increases from project-related increase in traffic would be barely perceptible and would not be significant.

4.7 Infrastructure Impacts

4.7.1 No Action Alternative

No changes in personnel would occur under the No Action Alternative and, therefore, there would be no impacts to infrastructure.

4.7.2 Proposed Action

It is anticipated that water and sewer connections can be made from the proposed modular buildings to the existing adjacent water and sanitary sewer lines. Several existing utilities are within the footprint of the proposed buildings and would need to be relocated. According to the feasibility report prepared for the Proposed Action, initial assessments indicate that the following relocations of utilities would be required:

- 800 ft (244 m) of 8-in (20-cm) diameter sanitary sewer and four manholes.
- 500 ft (152 m) of 10-in (25-cm) diameter water line.
- 1,200 ft (366 m) of 27.5 KVA overhead electric line.

The feasibility report anticipates that sufficient capacity exists for domestic water (including fire flow), sanitary sewer, and electricity.

4.7.3 North Post Alternative

The utility systems at Fort Belvoir are expected to be able to accommodate the relocation under the North Post Alternative.

4.8 Impacts on Cultural Resources

Section 106 of the NHPA provides that federal agencies take into account the effects of their actions on any district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. Implementing regulations for Section 106 established by the Advisory Council on Historic Preservation are contained in 36 CFR Part 800; Protection of Historic Properties, as amended in January 2001. These regulations provide specific criteria for identifying adverse effects on historic properties. As shown in [Table 4-10](#), the effects of an undertaking on a cultural resource are predicted by evaluating the significant characteristics of the resource and the design and anticipated consequences of the undertaking. Cultural resources

Table 4-10

Criteria of Adverse Effect

Criteria of Adverse Effect
<p>“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative” (36 CFR 800.5[a][1]).</p>
Examples of Adverse Effect
<p>“Adverse effects on historic properties include, but are not limited to:</p> <ol style="list-style-type: none"> 1. Physical destruction of or damage to all or part of the property; 2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines; 3. Removal of the property from its historic location; 4. Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance; 5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features; 6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; 7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property’s historic significance” (36 CFR 800.5[a][2]).

at Fort Belvoir in general were described in Subchapter 3.8 of the May 2001 EA, and cultural resources at the 1400 area and 1900 area relocation sites in particular have been described in [Subchapter 3.8](#) of this supplemental EA. Effects to cultural resources listed in, or eligible for listing in, the National Register of Historic Places are evaluated with regard to the Criteria of Adverse Effect set forth in 36 CFR 800.5(a)(1).

4.8.1 No Action Alternative

Under the No Action Alternative, there would be no impacts on cultural resources at Fort Belvoir.

4.8.2 Proposed Action and North Post Alternative

The 1400 area and 1900 area relocation sites do not contain any cultural resources listed in, or eligible for, the National Register. Furthermore, neither the Proposed Action nor the North Post Alternative would impact the Camp A. A. Humphreys Pump Station and Filter Building National Register-eligible site.

4.9 Impacts on Natural Resources

4.9.1 Topography and Geology

4.9.1.1 No Action Alternative

There would be no changes to topography or geology under the No Action Alternative.

4.9.1.2 Proposed Action and North Post Alternative

Both the Proposed Action and the North Post Alternative would consist of constructing modular buildings and parking areas on surfaces that were previously developed and relatively flat. The minor amount of excavation, grading and leveling involved – an estimated total of approximately 29,900 cubic yards (22,900 cubic meters) on the 1400 area relocation site under the Proposed Action – would not significantly alter the topography or geology of the 1400 area or 1900 area relocation sites.

4.9.2 Floodplains

4.9.2.1 No Action Alternative

There would be no impacts on the 100-year or 500-year floodplains under the No Action Alternative.

4.9.2.2 Proposed Action and North Post Alternative

Because no 100-year floodplains occur within or adjacent to the 1400 area or 1900 area relocation sites, there would be no impact on floodplains as a result of implementation of either the Proposed Action or the North Post Alternative.

4.9.3 Soils

4.9.3.1 No Action Alternative

There would be no impacts on soils at either of the sites under the No Action Alternative.

4.9.3.2 Proposed Action and North Post Alternative

Implementation of either the Proposed Action or the North Post Alternative would disturb some cut and fill and urban land soils. Under the Proposed Action, an estimated 11,218 cubic yards (8,582 cubic meters) of topsoil would be stripped on the 1400 area relocation site. About half of this stripped topsoil would be hauled offsite and half would be spread on the site.

Short-term best management practices, including silt fences and temporary sedimentation basins, would be used during construction to minimize erosion and sedimentation of exposed soils.

4.9.4 Groundwater

4.9.4.1 No Action Alternative

There would be no impacts on groundwater quantity or quality on Fort Belvoir under the No Action Alternative.

4.9.4.2 Proposed Action

The Proposed Action would increase the amount of impermeable surface on the 1400 area relocation site by an estimated 10.9 acres (4.4 hectares) or about 475,900 sq ft (44,200 sq m); comprising the following:

- 275,000 sq ft (25,550 sq m) of building footprint.
- 179,478 sq ft (16,674 sq m) of parking area paving.
- 21,375 sq ft (1,986 sq m) of sidewalk.

The Proposed Action would not require any withdrawal of groundwater since the water supply on Fort Belvoir is provided by the Fairfax County Water Authority system.

4.9.4.3 North Post Alternative

The North Post Alternative would increase the amount of impermeable surface on the 1900 area relocation site. The scale of this increase is expected to be comparable to the increase attributed to the Proposed Action. Because the Fairfax County Water Authority supplies potable water, the North Post Alternative would not increase demand on aquifers for potable water.

4.9.5 Surface Water

4.9.5.1 No Action Alternative

There would be no changes in surface water quality under the No Action Alternative.

4.9.5.2 Proposed Action

Implementation of the Proposed Action would not require surface waters to be filled, eliminated, or significantly modified. However, with respect to stormwater runoff, implementation of the Proposed Action would result in removal of landscaped areas, open field communities, and a woodlot and an increase in the amount of impervious surfaces present. As discussed in [Subchapter 4.9.4.2](#), the amount of impermeable surface on the 1400 area relocation site would increase by an estimated 10.9 acres (4.4 hectares) under the Proposed Action.

In addition, as discussed in [Subchapter 4.9.3.2](#), construction of the modular buildings and parking areas would disturb some cut and fill and urban land soils. An estimated 11,218 cubic yards (8,582 cubic meters) of topsoil would be stripped on the 1400 area relocation site.

A low-impact development (LID) strategy designed to mimic the predevelopment site hydrology would protect surface and groundwater quality, and protect the physical integrity of the receiving

streams. LID design can reduce impervious surfaces, decrease the use of storm drain piping, and eliminate large stormwater management ponds. Bioretention areas would be integrated into the parking lots to store, infiltrate, evaporate, and detain stormwater runoff as well as provide space for aesthetically pleasing landscaping. Natural drainage ways would be preserved to convey runoff over and off the site. Existing buffers on drainage ways would be protected and enhanced with additional plantings.

Potential surface water impacts would be minimal as short-term best management practices, including silt fences and temporary sedimentation traps, would be used during construction to minimize erosion and sedimentation.

4.9.5.3 North Post Alternative

As for the Proposed Action, the North Post Alternative would not require surface waters to be filled, eliminated, or significantly modified. Implementation of the alternative would result in the removal of currently vegetated areas, the disturbance of soils, and a substantial increase in the amount of impervious surfaces on the 1900 area relocation site. Short-term best management practices would be used during construction to minimize erosion and sedimentation, and thereby control potential surface water impacts. An LID strategy, as described in [Subchapter 4.9.5.2](#), would be used to minimize post-construction impacts on surface waters.

4.9.6 Vegetation

4.9.6.1 No Action Alternative

There would be no impacts on vegetation under the No Action Alternative.

4.9.6.2 Proposed Action

Impacts to vegetation would result from the removal or clearing of vegetated areas for development. Implementation of the Proposed Action would result in the loss of up to approximately 21 ac (8.5 ha) of vegetation. Included in this area is approximately 2 ac (0.8 ha) of small trees and brush – including white oak, scarlet oak, and white pine – in the woodlot in the northeast corner of the 1400 area relocation site. This wooded parcel would be cleared to construct a parking area, resulting in the loss of the functional value that such wooded areas provide, such as open space, wildlife habitat, and soil erosion control. Along the east side of Hall Road, the strip of mowed lawn and adjacent strip of open field vegetation and shrubs – totaling about 3 ac (1.2 ha) – also would be cleared to accommodate one of the modular buildings. The remainder of the vegetated areas that would be cleared – approximately 16 ac (6.5 ha) – comprise a park-like landscape with scattered large trees and a grass understory. These areas would accommodate modular buildings, parking areas, sidewalks and lawns.

The clearing and disturbance of vegetation would be minimized through measures such as:

- Designating and marking mature trees that are not to be removed.
- Designating specific locations where vegetation is not to be cleared.
- Restricting construction machinery and material storage to designated locations.

In addition, consistent with the Fort Belvoir Directorate of Installation Support Tree Removal and Protection Policy, for each tree removed during construction, two trees would be planted on site, if possible, in bioretention areas and drainageway buffers.

4.9.6.3 North Post Alternative

Implementation of the North Post Alternative would result in the potential removal or clearing of vegetated areas at a scale comparable to that anticipated for the Proposed Action. Cleared vegetated areas on the 1900 area relocation site would comprise a mixture of improved and semi-improved areas, dominated by turf grasses and landscape trees and shrubs.

4.9.7 Wetlands and Chesapeake Bay Preservation Areas

4.9.7.1 No Action Alternative

There would be no impacts to wetlands or RPAs under the No Action Alternative.

4.9.7.2 Proposed Action and North Post Alternative

No wetlands or RPAs occur within either the 1400 area or the 1900 area relocation sites, and no wetlands or RPAs would be impacted by the construction of the modular buildings or new parking areas. Short-term best management practices, including silt fences and temporary sedimentation basins, would be used during construction to minimize erosion and sedimentation.

4.9.8 Wildlife

4.9.8.1 No Action Alternative

The No Action Alternative would result in no changes in habitat or use patterns at Fort Belvoir, and, therefore, no impacts on wildlife or wildlife habitat would occur under this alternative.

4.9.8.2 Proposed Action and North Post Alternative

Impacts to wildlife would result from the removal or clearing of the limited, existing habitat for development. Wildlife use of the 1400 area and 1900 area relocation sites is limited by the intensive level of development in and adjacent to the sites, and consistent disturbance by humans, but several wildlife species that are highly tolerant of human disturbance are expected to occur on the sites, as discussed in [Subchapter 3.9.8](#). An estimated 21 ac (8.5 ha) of wildlife habitat on the 1400 area relocation site would be removed under the proposed action.

The loss of these habitats – comprising approximately 2 ac (0.8 ha) of small trees and brush in the woodlot in the northeast corner of the site, 3 ac (1.2 ha) of mowed lawn, open field vegetation and shrubs along the east side of Hall road, and 16 ac (6.5 ha) of park-like landscape with large trees and a grass understory – would directly impact resident wildlife. The removal of these habitats and the disturbance of wildlife in other habitats proximal to construction and other human activities would result in mobile wildlife species moving to suitable habitats both on and off the sites. Construction equipment would also cause some mortality in smaller, less mobile animals, such as toads, salamanders, mice, and voles.

There may be potential secondary effects on wildlife resulting from the greater number of personnel on post, leading to increased interactions between people and wildlife (not necessarily beneficial to wildlife) and increased public demand for access to wildlife (e.g., hunting, fishing, nature watching, and environmental education). Overall, however, the Proposed Action or North Post Alternative would have a negligible impact on wildlife resources at Fort Belvoir.

4.9.9 Threatened and Endangered Species

4.9.9.1 No Action Alternative

The No Action Alternative would have no impact on either federal or state-listed threatened or endangered species.

4.9.9.2 Proposed Action and North Post Alternative

The Proposed Action and North Post Alternative have little potential for impact to federally listed threatened or endangered species or state-listed rare, threatened, or endangered species because of a lack of appropriate wildlife habitat on the 1400 area and 1900 area relocation sites and the extremely developed conditions present. No occurrence of any protected species has been recorded on or adjacent to the sites. Based on a description of the proposed project, USFWS concluded that the project is not likely to adversely affect any federally listed or proposed species or their designated critical habitat (Mayne, May 202, 2002); and VDCR/DNH stated that

it does not anticipate that the project would adversely impact natural heritage resources (Locklear, May 24, 2002; letter in [Appendix A](#)).

4.10 Impacts on Hazardous Substances

4.10.1 No Action Alternative

Implementation of the No Action Alternative would result in no new construction or redevelopment. Thus, there would be no additional use of hazardous materials or generation of hazardous wastes.

4.10.2 Proposed Action and North Post Alternative

Implementation of either the Proposed Action or the North Post Alternative would not result in an increase in the use of hazardous materials or generation of hazardous waste.

No environmental impacts related to storage tanks, either ASTs or USTs, are anticipated in areas presently or formerly associated with ASTs and USTs. The two existing ASTs associated with the two empty buildings in the northern portion of the 1400 area relocation site would be removed when the buildings are demolished. It is not anticipated that minor regrading or similar activities associated with developing either the 1400 area or 1900 area relocation sites would be deep enough to encounter potentially contaminated soils. However, any excavation (e.g., for laying utility lines such as storm sewers) potentially may encounter contaminated material or abandoned USTs.

4.11 Cumulative Impacts

Cumulative impacts have been defined by the CEQ in 40 CFR 1508.7 as:

Impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

The CEQ regulations further require that NEPA environmental analyses address connected, cumulative, and similar actions in the same document (40 CFR 1508.25). This requirement prohibits segmentation of a project into smaller components to avoid required environmental analysis.

There are a number of plans being planned for implementation at Fort Belvoir that, considered together with the relocation of AMC personnel to the post and construction of the temporary buildings and parking lots to accommodate them, could have the potential to negatively affect the transportation system, air quality, stormwater runoff, and water quality on and in the vicinity of the post. Each of the proposed projects individually may not introduce severe adverse impacts, but taken together, the projects have the potential to do so, particularly if mitigation measures do not consider all the proposals together.

Even before the terrorist attack on September 11, 2001, Fort Belvoir was conducting access control exercises to determine how best to control vehicle access through its gates. Following the 9/11 attack, all roads through the post other than the Fairfax County Parkway, US Route 1, and Backlick Road were closed to public access. Beulah Street at Telegraph Road will reopen to DoD-registered vehicles on June 3, 2002. Personnel from both the Virginia Department of Transportation (VDOT) and Fairfax County are participating in a working group reviewing access control issues on Fort Belvoir's roads and at the gates. When long-term decisions on access are made, they will have an effect on the traffic patterns in and around the post.

Three projects are well-articulated with planning and design in advanced stages. Environmental assessments are being prepared for them that will address the cumulative effects of the proposed action in this EA – including traffic, air quality, and natural resource impacts – combined with the impacts of each of the other projects. The three projects for which implementation is probable are:

- **New Hospital** – The design for a new Army hospital/medical treatment facility, approximately 418,000 gross sq ft (38,832 gross sq m) in size, is well underway. The facility would replace the existing 44-year old Dewitt Army Community Hospital on South Post. Alternative locations under consideration include a preferred site north of the PX, west of Woodlawn Road, and south of John J. Kingman Road on North Post and an alternative site off Gunston Road on South Post. The new facility would have only about one tenth of the beds that the older hospital originally was built for, and would focus on outpatient and same day surgery services, emergency care, birthing, primary care and secondary care, preventive medicine, and dental care. Because the preferred location for the hospital was not zoned for this use in the Fort Belvoir Master Plan, a master plan supplement is being prepared with an accompanying EA that describes the impacts of the master plan changes.
- **Construction of T Block Addition to the Defense Communications Electronics Evaluation and Testing Agency** – Because of increased mission requirements, DCEETA plans to add 122,000 sq ft (11,334 sq m) of administrative office space to their headquarters building to accommodate

approximately 250 new personnel. A parking structure with 1,194 spaces would be built on an existing parking lot.

- **Fort Belvoir Infrastructure Improvements** – Fort Belvoir proposes to build new infrastructure that would comprise remote fuel oil and gasoline delivery, storage and distribution facilities, remote water storage and distribution facilities, and an underground electrical duct bank. to improve force protection for critical facility operations in the northern part of the installation.

Eight other major projects are in earlier stages of conceptualization and planning, and their eventual implementation may or may not occur, or later plans may evolve to encompass different elements.

- **Army Museum** – Proposals are gaining momentum to build a Museum of the US Army on the post that would commemorate the Army's history and exploits. It likely would be located in the 1200 area near the southeast corner of US Route 1 and Belvoir Road.
- **Tompkins Basin Recreation Area** – A master plan has recently been developed and an environmental assessment of the plan is in process for this proposal to build recreational facilities for military use in the Gunston Cove/Tompkins Basin area, southwest of the 200 Area at the end of Warren Rd. on Accotink Bay. Proposed are tent and recreational vehicle sites, rental cabins, a lodge, and a 150-room hotel with conference center and restaurant.
- **Widening of US Rt. 1** – The Virginia Department of Transportation (VDOT) is considering widening US Route 1 through Fort Belvoir in the future. This action would require outgrants of land to VDOT by Fort Belvoir and would affect traffic levels near the post.
- **Building for US Army Intelligence** – The US Army Intelligence Command is planning to build a new office building and parking structure near their existing headquarters building east of Beulah Road and south of Kingman Road to accommodate about 800 personnel.
- **Privatization of Post Housing** – Alternative plans are being developed to upgrade post housing by turning over the housing to a developer who would renovate housing or demolish older units and rebuild new ones in their place.
- **North Post Transportation Study** – As part of the post's on-going process to evaluate options for increasing force security, this recent study identified transportation alternatives for the North Post to improve security. Examined were

north-south roadway alternatives to replace existing Beulah Street and Woodlawn Road, the potential to completely close the North Post to off-site traffic, and improvements to local off-site roads to accommodate traffic redirected around North Post. The impacts of closing old roads and locating new ones would be evaluated in further environmental documentation if any of the plans proposed in the North Post Transportation Study are pursued.

- **Administrative Park Site Evaluation Report** – In this study, completed in May 2000, several sites were investigated for their potential to accommodate an office park with several million square feet of office space. The sites investigated were located in the EPG, on North Post, and the southwest area of the post south of US Route 1 and west of Pohick Road. No decision has been reached about a preferred site or even whether the proposal will go forward into the next phase of study.
 - **Renovation of Dogue Creek Marina** – This proposed project would involve dredging Dogue Creek and replacing all marina facilities.
-

4.12 Mitigation Measures

The following measures will be implemented as part of the Proposed Action to mitigate the impact of the AMC relocation to Fort Belvoir:

1. **Transportation Mitigation Measures** – As detailed in [Subchapter 4.4.2.4](#), to mitigate the impacts of the AMC relocation to Fort Belvoir:
 - Open Beulah Street south of Telegraph Road to Post traffic only. This action will reduce the average vehicle delay for westbound Kingman Road right turn to northbound Fairfax County Parkway.
 - Lieber Gate will be opened to right turn exiting traffic for approximately three hours during the evening peak period to reduce the average vehicle delay for the northbound left turn from Pohick Road to westbound US Route 1.
 - Open the ramp from Gunston Road to northbound Route 1 for approximately three hours during the evening peak period to reduce the average vehicle delay for the eastbound left turn from 9th Street to northbound Belvoir Road.
2. **Transportation Management Plan** – As detailed in [subchapter 4.4.3](#), to increase the use of ridesharing and public transportation, Fort Belvoir will: be mindful of the placement of bus stops when planning facilities; complete the Fort Belvoir Mass Transit Study during the current calendar year; continue and improve the Transportation Coordination Office; continue and emphasize a rideshare matching service; promote increased use of telecommuting, staggered work hours, flex time, and compressed schedules; and

continue and promote the transit discount program. AMC and co-located activities will actively support and promote the programs of the Transportation Coordination Office among their personnel.

3. **Low-Impact Development Strategy** – A low-impact development (LID) strategy designed to mimic the predevelopment site hydrology would protect surface and groundwater quality, and protect the physical integrity of the receiving streams. Bioretention areas would be integrated into the parking lots to store, infiltrate, evaporate, and detain stormwater runoff as well as provide space for aesthetically pleasing landscaping. Natural drainage ways would be preserved to convey runoff over and off the site. Existing buffers on drainage ways would be protected and enhanced with additional plantings.
4. **Tree Replacement** – Consistent with the Fort Belvoir Directorate of Installation Support Tree Removal and Protection Policy, for each tree removed during construction, two trees would be planted on site, if possible, in bioretention areas and drainageway buffers.
5. **Increased Use of Post Facilities** – Fort Belvoir will make a commitment to maintaining wildlife refuge facilities, fishing facilities, and the Environmental Education Center to support increased demand resulting from the increase in personnel using post facilities.
6. **Landscape Maintenance Practices** – Fort Belvoir will adhere to the principles of low impact landscape maintenance in the post's developed areas. Such methods include the use of integrated pest management, beneficial landscaping, native plants, innovative stormwater techniques, sound urban forestry techniques, and water efficient practices, as detailed in Section 10 of the INRMP (US Army Garrison Fort Belvoir, March, 2001).

4.13 Unavoidable Adverse Impacts

Implementation of the Proposed Action would result in some insignificant but unavoidable adverse impacts:

- The construction of the modular buildings and parking areas would require the clearance of up to approximately 10.9 acres of mixed turf grasses, trees and shrubs, including the loss of an approximately 3-acre (1-hectare) woodlot.
- Construction equipment would also cause some mortality in smaller, less mobile animals, such as toads, salamanders, mice, and voles.
- Construction activities would generate minor, temporary disturbances, including noise, construction equipment traffic, fumes, minor erosion and sedimentation impacts.

4.14 Relationship between Local Short-term Uses of the Environment and the Enhancement of Long-term Productivity

Implementation of the Proposed Action would have long-term benefits for AMC personnel, who would be able to carry out their mission with the appropriate level of security and force protection in the more appropriate context of a large military installation. The presence on Fort Belvoir of 1,170 additional personnel would result in a slightly more intensive use of existing resources.

4.15 Irreversible and Irretrievable Commitments of Resources

The construction of the modular buildings and parking areas would expend modest amounts of fuel and man hours in site preparation and construction. Modest amounts of energy to heat, cool, and light the buildings would be used in their operations.

4.16 Conclusion

The Proposed Action, as described and assessed in this document, is not expected to have a significant, long-term, adverse impact on the environment, nor is it expected to create environmentally-based controversy. Therefore, an environmental impact statement will not be prepared.

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5 RELATIONSHIP OF THE PROPOSED ACTION TO FEDERAL, STATE, AND LOCAL PLANS, POLICIES AND CONTROLS

The implementation of the proposed action would comply with existing federal regulations and with state, regional, and local policies and programs. The federal acts, executive orders, and policies with which the proposed action must demonstrate compliance include:

- NEPA.
- Clean Water Act.
- Clean Air Act.
- CERCLA and SARA.
- Endangered Species Act.
- National Historic Preservation Act.
- Coastal Zone Management Act.
- Executive Order 11990, Protection of Wetlands.
- Executive Order 11988, Floodplain Management.
- Executive Order 12898 and 13045, Environmental Justice and the Protection of Children
- Other State and Local Plans and Policies

5.1 NEPA

NEPA is the National Environmental Policy Act of 1969. This Environmental Assessment has been prepared in accordance with the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1500-1508) and Army Regulation (AR) 200-2, "Environmental Effects of Army Actions" at 32 CFR Part 651. Executive Order 11991 of May 24, 1977 directed the CEQ to issue regulations for procedural provisions of NEPA; these are binding for all federal agencies.

5.2 Clean Water Act

The Clean Water Act of 1977 (which amends the Federal Water Pollution Act of 1972) and subsequent amendments were designed to assist in restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The act covers the discharge of pollutants into navigable waters, wastewater treatment management, and protection of relevant fish, shellfish, and wildlife. Congress also passed the Water Quality Act of 1987 to address the

excessive levels of toxic pollutants still found in some waters. None of the alternatives considered would generate any point source pollution or shoreline pollution.

5.3 Clean Air Act

The Clean Air Act (CAA) of 1955 and subsequent amendments specify regulations for control of the nation's air quality. Federal and state ambient air standards have been established for each criteria pollutant. The 1990 amendments to the CAA require federal facility compliance with all applicable substantive and administrative requirements for air pollution control. Under either the Proposed Action or the North Post Alternative, there would be no violations of either the one-hour or the eight-hour CO standard as a result of increases in traffic volumes. The proposed temporary buildings may contain natural gas fired boilers for space heating. Once the exact type and size of these boilers is established, it will be determined whether a permit is necessary under the VDEQ air permit regulations.

Because Fort Belvoir is located in a serious ozone nonattainment area, a general conformity rule analysis was conducted according to the guidance provided by the USEPA in *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (November 30, 1993). The results of this analysis indicate that emission values for the Proposed Action or North Post Alternative would not exceed the *de minimis* criteria of 50 tpy (45 tpy) of VOCs or NO_x; therefore, a formal conformity determination is not required. Furthermore, the *Final State Implementation Plan Revision, Phase I Attainment Plan* (MWWCOG, October, 1997) sets forth daily target levels of 362.9 tons per day (tpd) of VOCs and 637.1 tpd of NO_x for the Washington Metropolitan ozone nonattainment area (which includes Fairfax County). The increase in annual emissions would not make up ten percent or more of the available regional emission inventory for VOCs or NO_x and, therefore, would not be regionally significant.

5.4 CERCLA and SARA

In 1980, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was passed in order to provide a superfund for cleanup of sites with uncontrolled releases of hazardous substances. This program was continued in the Superfund Amendments and Reauthorization Act (SARA) of 1986. Section 211 of SARA provides continued authorization for the DoD Environmental Restoration Program and the Defense Environmental Restoration Account. Major responsibilities for monitoring compliance with these acts rest with the USEPA. Implementation of the Proposed Action or North Post Alternative would not disturb hazardous materials or waste sites.

5.5 Endangered Species Act

The Endangered Species Act of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants, as well as the habitats in which they are found. The Proposed Action or North Post Alternative would have no adverse impact on threatened or endangered species or their habitats.

5.6 National Historic Preservation Act

The National Historic Preservation Act (NHPA) was passed in 1966 to provide for the protection, enhancement, and preservation of any property that possesses significant architectural, archaeological, historical, or cultural characteristics. Executive Order 11593 of 1974 further defined the obligations of federal agencies concerning this act. Section 106 of NHPA requires the head of any federal agency having direct or indirect jurisdiction over a proposed federal or federally financed undertaking, prior to the expenditure of any federal funds on the undertaking, to take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.

No adverse effects on cultural resources would result from implementing either the Proposed Action or the North Post Alternative.

5.7 Coastal Zone Management Act

Federal agencies are directed by Section 307(c)(1) of the Coastal Zone Management Act Reauthorization Amendment (CZMARA) to ensure that their actions be consistent with state CZM policies and programs to the maximum extent practicable. In Virginia, the Coastal Resource Management Program (CRMP) is based on application of policies and goals within a core of eight commonwealth regulatory programs, including Fisheries Management, Subaqueous Lands Management, Wetlands Management, Dunes Management, Nonpoint Source Pollution Control, Point Source Pollution Control, Shoreline Sanitation, and Air pollution Control. Compliance with and receipt of approvals from these programs implies consistency with CRMP requirements.

Neither the Proposed Action nor the North Post Alternative would have any effect that would fall within the purview of the Commonwealth of Virginia's current coastal legislation and enforceable policies as described in the state's federally approved CRMP.

5.8 Executive Order 11990, Protection of Wetlands

This order of May 24, 1977 directs federal agencies to take action to protect wetlands on their property and mandates review of proposed actions on wetlands through procedures established by NEPA. The Proposed Action or North Post Alternative would have no adverse impact on wetlands.

5.9 Executive Order 11988, Floodplain Management

This order sets forth the responsibilities of federal agencies in reducing the risk of flood loss or damage to personal property, minimizing the impact of flood loss, and restoring the natural and beneficial functions of floodplains. The order was issued in furtherance of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The Proposed Action or North Post Alternative would have no adverse impact on floodplains.

5.10 Executive Orders 12898 and 13045, Environmental Justice and the Protection of Children

Signed on February 11, 1994, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, aims to prevent minority and low-income communities being disproportionately affected by the negative impacts on the environment of federal actions. Similarly, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, signed on April 21, 1997, aims to prevent children being disproportionately affected by such impacts.

Both EOs are described more at length in [subchapter 4.2](#). As indicated there, neither the Proposed Action nor the North Post Alternative would disproportionately affect minority or low-income communities, or children.

5.11 Other State and Local Plans and Policies

The Army pursues close and harmonious planning relations with local and regional agencies and planning commissions of adjacent cities, counties, and states for cooperation and resolution of mutual land use and environmentally-related problems. In addition, notification may be made to state and regional planning clearinghouses as established pursuant to Executive Order 12372, *The Presidential Intergovernmental Review of Federal Programs*, signed on July 14, 1982.

In preparing this EA, information from relevant state, regional, and local agencies was reviewed for data on potential impacts of the Proposed Action and alternatives, including that of Fairfax County. The proposed action would be consistent with existing and future land use patterns and other applicable plans and policies.

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7 ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ac AMC AST AR	Acres Army Materiel Command Above ground storage tank Army Regulation
CAA CAAA CAMA CBLAD CBPA CBPO CDP CERCLA CEQ CFR cm CO CPNC CRMP CWA CZM CZMA CZMARA	Clean Air Act Clean Air Act Amendments Coastal Area Management Act Chesapeake Bay Local Assistance Department Chesapeake Bay Preservation Act Chesapeake Bay Preservation Ordinance Census Designated Place Comprehensive Environmental Response, Compensation, and Liability Act Council on Environmental Quality Code of Federal Regulations Centimeter Carbon monoxide Comprehensive Plan for the National Capital Coastal Resources Management Plan Clean Water Act Coastal Zone Management Coastal Zone Management Act Coastal Zone Management Act Reauthorization Amendments
dB dBA dBP DIS DLA DNL DoD DRMO DTRA DVP	Decibel A-weighted decibel Linear peak sound level Directorate of Installation Support Defense Logistics Agency Day-night average sound level Department of Defense Defense Reutilization and Marketing Office Defense Threat Reduction Agency Dominion Virginia Power
EA EIS EMS EMT EO EPG ESA	Environmental Assessment Environmental Impact Statement Emergency medical service Emergency Medical Technician Executive Order Engineer Proving Grounds Endangered Species Act
FCPS FCWA FEMA	Fairfax County Public Schools Fairfax County Water Authority Federal Emergency Management Agency

Acronym/Abbreviation	Definition
FHWA FICON FNSI ft FY	Federal Highway Administration Federal Interagency Committee on Noise Finding of No Significant Impact Foot (feet) Fiscal year
gal GIS GDP	Gallon Geographic Information System Gallons per day
ha HAP HEC HQC	Hectares Hazardous Air Pollutant Humphrey Engineer Center Headquarters Complex
I-95 I/M in INCMP INRMP INSCOM IRP	Interstate 95 Inspection and maintenance Inch Integrated Cultural Resources Management Plan Integrated Natural Resources Management Plan US Army Intelligence and Security Command Installation Restoration Program
km kpy kV KVA	Kilometer Kilograms per year Kilovolts Kilovolt-ampere
l LID LOS LPD	Liter Low-impact development Level of service Liters per day
m mi MOA MP mph msl MWAQC MWCOG	Meter Miles Memorandum of Agreement Military Police Miles per hour Mean sea level Metropolitan Washington Air Quality Committee Metropolitan Washington Council of Governments
NAAQS NAWQA NEPA NESHAPS NCO NCPC NCR NHPA NO NO ₂ NO _x NPDES	National Ambient Air Quality Standards National Water Quality Assessment National Environmental Policy Act National Emission Standards for Hazardous Air Pollutants Non-commissioned officer National Capital Planning Commission National Capital Region National Historic Preservation Act Nitric oxide Nitrogen dioxide Nitrogen oxide National Pollutant Discharge Elimination System

Acronym/Abbreviation	Definition
NRCS NRHP NSPS	Natural Resources Conservation Service National Register of Historic Places New Source Performance Standards
O ₃	Ozone
Pb PCS PM PM<2.5(10) PM10 ppm	Lead Permanent change of station Particulate matter Particulate matter 2.5 (10) microns or less Particulate matter 10 microns or less Parts per million
RCRA REC RMA RPA	Resource Conservation and Recovery Act Record of Environmental Consideration Resource Management Area Resource Protection Area
SARA SCS SIP SPCC SO ₂ sq ft sq m SWMU	Superfund Amendments and Reauthorization Act Soil Conservation Service State Implementation Plan Spill Prevention Control and Countermeasures Plan Sulfur dioxide Square feet Square meters Solid waste management unit
TBO TMP TPM tpy TSP	Total build-out Transportation management plan. Total particulate matter Tons per year Total suspended particulate matter
µg/m ³ USASAC USALIA USBEA USBLS USDA USEPA USFWS USGS UST	Micrograms per cubic meter Security Assistance Command Logistics Integration Agency US Bureau of Economic Analysis US Bureau of Labor Statistics US Department of Agriculture US Environmental Protection Agency US Fish and Wildlife Service US Geological Survey Underground storage tank
V/C VDACS VDCR/DNH VDEQ VDGIF VDHR VDOT VDWM VMT VOC VPDES	Volume to capacity ratio Virginia Department of Agriculture and Consumer Services Virginia Dept. of Conservation and Recreation/Division of Natural Heritage Virginia Department of Environmental Quality Virginia Department of Game and Inland Fisheries Virginia Department of Historic Resources Virginia Department of Transportation Virginia Department of Waste Management Vehicle miles traveled Volatile organic compound Virginia Pollutant Discharge Elimination System

Acronym/Abbreviation	Definition
VR	Virginia Regulation
VRE	Virginia Railway Express
WMATA	Washington Metropolitan Area Transit Authority

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8 LIST OF PREPARERS

This Environmental Assessment was prepared by:

TAMS CONSULTANTS, an Earth Tech Company

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Key personnel included:

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APPENDIX A

Coordination Letters

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6669 Short Lane
Gloucester, VA 23061



May 20, 2002

Ms. Christine Ross
TAMS Consultants, Inc.
655 Third Avenue
New York, New York 10017

Re: Environmental Assessment of Fort
Belvoir by U.S. Navy, # 2435,
Fairfax County, Virginia

Dear Ms. Ross:

The U.S. Fish and Wildlife Service has reviewed your May 10, 2002 request for information on federally listed species for the referenced project. This letter is submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Your client, the U.S. Navy, is preparing an Environmental Assessment (EA) to address the construction of modular buildings on two previously paved areas in Fort Belvoir, Virginia and the temporary relocation of 1,170 personnel from the U.S. Army Materiel Command Headquarters to the new buildings. Based on the project description and location, it appears that this project is not likely to adversely affect any federally listed or proposed species or their designated critical habitat.

If you have any questions or need further assistance concerning this project, contact Ms. Jolie Harrison at (804) 693-6694, extension 104.

TAMSCONSULTANTS INC.
BOSTON, MA
RECEIVED

MAY 29 2002

JOB NO: _____
CC: _____
FILE: _____

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

W. Tayloe Murphy, Jr.
Secretary of Natural
Resources



Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

May 24, 2002

Christine Ross
TAMS and Earth Tech Company
655 Third Avenue
New York, NY 10017

Re: Relocation site at Fort Belvoir

Dear Ms. Ross:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

BCD documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

In addition, our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

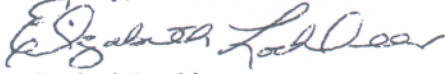
Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks additional natural heritage resources. New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of \$50.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 414, Richmond, VA 23219, ATTN: Cashier. Payment is due within thirty days of the invoice date.

An Agency of the Natural Resources Secretariat

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

A handwritten signature in cursive script, appearing to read "Elizabeth Locklear".

Elizabeth Locklear
Locality Liaison

APPENDIX B

Traffic Analysis Data

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Table B-1
Existing Conditions
Peak Hour Turning Movement Volumes
AM Peak Hour

	NB			SB			EB			WB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Fairfax Co Pkwy/Kingman	34	819	338	1115	748	28	5	20	19	27	30	155
Route 1/Fairfax Co Pkwy	0	0	0	688	0	23	297	2154	0	0	597	844
Route 1/Backlick-Pohick	0	0	0	80	22	5	32	2024	786	17	1436	57
Route 1/Belvoir Rd	154	0	113	0	0	0	0	1639	465	207	1356	0
Route 1/Woodlawn	0	0	0	72	0	27	68	1684	0	0	1536	132
Belvoir Road/9th Street	32	212	10	29	535	103	25	6	16	7	6	15
Gunston/9th Street	0	285	5	80	288	0	0	0	0	6	0	168
Gunston/Pohick/12th Street	6	95	49	95	161	17	128	203	227	54	19	86

PM Peak Hour

	NB			SB			EB			WB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Fairfax Co Pkwy/Kingman	12	1247	42	280	795	2	46	26	43	403	19	1156
Route 1/Fairfax Co Pkwy	0	0	0	715	0	363	50	696	0	0	1481	1081
Route 1/Backlick-Pohick	1006	61	9	143	11	17	38	1247	126	25	1539	110
Route 1/Belvoir Rd	177	0	262	0	0	0	0	1304	95	148	1497	0
Route 1/Woodlawn	0	0	0	240	0	78	78	1488	0	0	1567	185
Belvoir Road/9th Street	50	444	9	11	133	34	104	10	19	14	11	29
Gunston/9th Street	0	279	8	136	395	0	0	0	0	4	0	95
Gunston/Pohick/12th Street	268	146	65	109	98	212	28	87	44	26	178	89

Table B-2
No Action Alternative -- Year 2003
Peak Hour Turning Movement Volumes

	AM Peak Hour											
	NB			SB			EB			WB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Fairfax Co Pkwy/Kingman	34	830	338	1115	755	28	5	20	19	27	30	155
Route 1/Fairfax Co Pkwy	0	0	0	694	0	23	300	2172	0	0	605	851
Route 1/Backlick-Pohick	0	0	0	81	22	5	32	2048	786	17	1451	58
Route 1/Belvoir Rd	154	0	113	0	0	0	0	1664	465	207	1372	0
Route 1/Woodlawn	0	0	0	72	0	27	68	1709	0	0	1552	132
Belvoir Road/9th Street	32	212	10	29	535	103	25	6	16	7	6	15
Gunston/9th Street	0	285	5	80	288	0	0	0	0	6	0	168
Gunston/Pohick/12th Street	6	95	49	95	161	17	128	203	227	54	19	86

	PM Peak Hour											
	NB			SB			EB			WB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Fairfax Co Pkwy/Kingman	12	1257	42	280	805	2	46	26	43	403	19	1156
Route 1/Fairfax Co Pkwy	0	0	0	724	0	363	50	704	0	0	1492	1090
Route 1/Backlick-Pohick	1006	61	9	144	11	17	38	1264	126	25	1559	111
Route 1/Belvoir Rd	177	0	262	0	0	0	0	1322	95	148	1518	0
Route 1/Woodlawn	0	0	0	240	0	78	78	1506	0	0	1588	185
Belvoir Road/9th Street	50	444	9	11	133	34	104	10	19	14	11	29
Gunston/9th Street	0	279	8	136	395	0	0	0	0	4	0	95
Gunston/Pohick/12th Street	268	146	65	109	98	212	28	87	44	26	178	89

Table B-3
Action Alternative -- Year 2003
Peak Hour Turning Movement Volumes

	AM Peak Hour											
	NB			SB			EB			WB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Fairfax Co Pkwy/Kingman	34	830	338	1245	787	28	5	20	19	27	30	164
Route 1/Fairfax Co Pkwy	0	0	0	726	0	23	300	2319	0	0	614	851
Route 1/Backlick-Pohick	0	0	0	81	22	5	32	2048	965	17	1460	58
Route 1/Belvoir Rd	163	0	118	0	0	0	0	1664	465	291	1372	0
Route 1/Woodlawn	0	0	0	72	0	27	68	1714	0	0	1636	132
Belvoir Road/9th Street	32	212	10	29	535	188	39	6	16	7	6	15
Gunston/9th Street	0	466	5	94	288	0	0	0	0	6	0	253
Gunston/Pohick/12th Street	6	97	49	95	161	17	307	203	227	54	19	86

	PM Peak Hour											
	NB			SB			EB			WB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Fairfax Co Pkwy/Kingman	12	1285	42	289	807	2	46	26	43	403	19	1270
Route 1/Fairfax Co Pkwy	0	0	0	726	0	363	50	714	0	0	1621	1118
Route 1/Backlick-Pohick	1163	61	9	144	11	17	38	1264	138	25	1559	111
Route 1/Belvoir Rd	177	0	335	0	0	0	0	1322	95	153	1518	0
Route 1/Woodlawn	0	0	0	240	0	78	78	1579	0	0	1593	185
Belvoir Road/9th Street	50	444	9	11	133	39	178	10	19	14	11	29
Gunston/9th Street	0	291	8	210	554	0	0	0	0	4	0	100
Gunston/Pohick/12th Street	268	146	65	109	100	369	40	87	44	26	178	89

APPENDIX C

General Conformity Rule Analysis

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C.1 Clean Air Conformity

The 1990 amendments to the Clean Air Act (CAA) require federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP) in a nonattainment area. The SIP is a plan that provides for implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS), and it includes emission limitations and control measures to attain and maintain the NAAQS. Conformity to a SIP, as defined in the CAA, means conformity to a SIP's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of such standards. The federal agency responsible for an action is required to determine if its action conforms to the applicable SIP.

The US Environmental Protection Agency (USEPA) has developed two sets of conformity regulations, and federal actions are appropriately differentiated into transportation projects and non-transportation-related projects:

- Transportation projects are governed by the “transportation conformity” regulations (40 CFR Parts 51 and 93), which became effective on December 27, 1993 and were revised on August 15, 1997;
- Non-transportation projects are governed by the “general conformity” regulations (40 CFR Parts 6, 51 and 93) described in the final rule for *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* that was published in the *Federal Register* on November 30, 1993. The general conformity rule became effective January 31, 1994 and has not been updated since then.

Since the Proposed Action is a non-transportation project, only the general conformity rule applies. This general conformity applicability analysis is prepared as an appendix to the Supplemental Environmental Assessment for implementation of the Temporary Relocation of Army Material that will occur as a result of the Proposed Action.

C.2 General Conformity

C.2.1 Attainment and Nonattainment Areas

The general conformity rule applies to federal actions occurring in air basins designated as nonattainment for the NAAQS or in attainment areas subject to maintenance plans (maintenance areas). Federal actions occurring in air basins that are in attainment with the NAAQS are not subject to the conformity rules.

A criteria pollutant is a pollutant for which an air quality standard has been established under the CAA. The designation of nonattainment is based on the exceedances or violations of the air quality standard. A

maintenance plan establishes measures to control emissions to ensure the air quality standard is maintained in areas that have been redesignated as attainment from a previous nonattainment status.

Under the requirements of the 1970 Clean Air Act (CAA), as amended in 1977 and 1990, the USEPA established standards, known as the NAAQS, for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), inhalable particulate matter (PM 10 and PM 2.5), and lead (Pb).

Areas that meet the NAAQS standard for a criteria pollutant are designated as being in “attainment;” areas where the criteria pollutant level exceeds the NAAQS are designated as being in “nonattainment.” Ozone nonattainment areas are subcategorized based on the severity of their pollution problem (marginal, moderate, serious, severe, and extreme). Particulate matter and carbon monoxide nonattainment areas are classified into two categories (moderate and serious). When insufficient data exists to determine an area’s attainment status, it is designated unclassifiable (or attainment).

The Proposed Action is a federal action and would be located in Fairfax County, Virginia, an area currently designated as serious nonattainment for ozone, but classified as attainment with respect to all the other criteria pollutants.

C.2.2 *De Minimis* Emissions Levels

To focus general conformity requirements on those federal actions with the potential to have significant air quality impacts, threshold (*de minimis*) rates of emissions were established in the final rule. A formal conformity determination is required when the annual net total of direct and indirect emissions from a federal action, occurring in a nonattainment or maintenance area, equals or exceeds an annual *de minimis* level. Table C-1 lists the *de minimis* level by pollutant.

For ozone nonattainment areas, USEPA’s conformity rules establish *de minimis* emission levels for both categories of ozone precursors [volatile organic compounds (VOC) and NO_x] on the presumption that both VOC and NO_x reductions will contribute to reductions in ozone formation. Since the project is located in a serious ozone nonattainment area, 50 tons per year (tpy) of VOCs or NO_x would apply.

Table C-1

De Minimis Emission Levels for Criteria Air Pollutants

Pollutant	Nonattainment Designation	Tons/Year
Ozone*	Serious	50
	Severe	25
	Extreme	10
	Other nonattainment areas outside ozone transport region	100
	Marginal and moderate nonattainment areas inside ozone transport region	50/100**
Carbon Monoxide	All	100
Sulfur Dioxide	All	100
Lead	All	25
Nitrogen Dioxide	All	100
Particulate Matter	Moderate	100
	Serious	70
Notes: * Applies to ozone precursors – volatile organic compounds (VOCs) and nitrogen oxides (NO _x). ** VOCs/NO _x		

C.2.3 Regional Significance

A federal action that does not exceed the threshold emission rates of criteria pollutants may still be subject to a general conformity determination if the direct and indirect emissions from the action exceed ten-percent of the total emissions inventory for a particular criteria pollutant in a nonattainment or maintenance area. If the emissions exceed this ten-percent threshold, the federal action is considered to be a “regionally significant” activity, and thus, the general conformity rules would apply.

C.2.4 Analysis

The conformity analysis for a federal action examines the impacts of the direct and indirect net emissions from mobile and stationary sources. Direct emissions are emissions of a criteria pollutant or its precursors that are caused or initiated by a federal action and occur at the same time and place as the action. Indirect emissions, occurring later in time and/or further removed in distance from the action itself, must be included in the determination if both of the followings apply:

- The federal agency can practicably control the emissions and has continuing program responsibility to maintain control; and
- The emissions caused by the federal action are reasonably foreseeable.

Operational Activities

After implementation of the Proposed Action, the new modular buildings are expected to be heated using several electric space heaters. Thus, there would be no net increase in the base-wide emissions due to the new heating sources.

Construction Activities

The Proposed Action consists of the construction of five modular buildings with a combined gross size of approximately 275,000 square foot (ft²) [25,575 square meter (m²)] and the construction and paving of a parking lot that would accommodate 844 spaces.

Increased direct and indirect VOC and NO_x emissions from construction would result from the following potential activities:

- Use of construction equipment;
- Movement of trucks containing construction materials; and
- Construction workers commutation.

In estimating construction-related NO_x and VOC emissions, the usage of equipment and the likely duration of each activity for the construction were determined based information on the building size provided by the contractors and field experience with similar types of building construction projects.

Manpower estimates for each activity were primarily obtained from *Heavy Construction Data* (Means, 2000) and additional modifications were made where necessary based on previous project experience. The weekly duration given for each activity is assumed to be eight hours per day and five days per week. For emission estimates purposes, all major building construction activities for the proposed project are assumed to occur over a six month period between July 2002 and December 2002.

Stages and Duration

In order to develop the activity-specific equipment usage data and the related manpower data, the construction stages and the duration and manpower at each stage are assumed and estimated as follows:

- Mobilization – Setting up trailer and temporary offices, with necessary site clearing and initial site survey. It would take two weeks with eight workers, including the survey crew.
- Construction of a Parking Lot – Construction the parking lot is estimated to take two weeks using 20 workers.
- Modular Building Construction –Construction would include excavation, foundations, concrete, plumbing, HVAC, electrical, fire protection and other miscellaneous building items such as architectural and interior blocks. It would take approximately 26 weeks using 50 workers on an average daily basis. It is also anticipated the major portion of construction would be completed by the end of 2002. It is assumed that building construction activities that occur in 2003 would largely be limited to the buildings' interior work (e.g., installation of lighting, etc.) and would not produce any appreciable emissions.

Construction Equipment

The number and type of equipment necessary for construction activities were determined for each stage. All equipment was assumed to be diesel-powered. Each piece of equipment is assumed to be operated continuously for 75 percent of the time during each working day. However, during the modular building installation phase, it was assumed that construction equipment would be in use only 50 percent of the time. Several pieces of equipment to be used during each stage include, but are not limited to:

- Backhoes;
- Excavators;
- Cranes;

- Dozers
- Loaders;
- Rollers;
- Pavers;
- Dump trucks; and
- Pickup trucks.

C.3 Construction Emissions Determination

C.3.1 Equipment Operation

Estimates of construction equipment emissions were based on the estimated hours of usage and emission factors for each motorized source for the project. Emission factors for NO_x and VOCs related to heavy-duty diesel equipment were obtained from *Non-Road Engine and Vehicle Emission Study Report* (USEPA, 1991). Emission factors are available for hydrocarbons (HC), which include all VOCs as well as other non-VOC constituents; therefore, HC emissions may be slightly higher than VOC emissions. For the purposes of this analysis the term VOC was used, but emission factors included all HC emissions.

Emission factors in grams of pollutant per hour per horsepower were multiplied by the estimated running time and equipment associated average horsepower provided by the USEPA to calculate total grams of pollutant from each piece of equipment. Finally, these total grams of pollutant were converted to tons of pollutant.

The USEPA recommends the following formula to calculate hourly emissions from non-road engine sources such as loaders, cranes, excavators, etc.:

$$M_i = N \times HP \times LF \times EF_i$$

Where:

M_i = mass of emissions of ith pollutants during inventory period;

N = source population (units);

HP = average rated horsepower;

LF = typical load factor;

EF_i = average emissions of ith pollutant per unit of use (e.g., grams per horsepower-hour).

A sample calculation for a backhoe engine NO_x emissions during site mobilization is provided below:

Operational Hours = 60 hours

Operational Emissions = 60 hours x 77 hp x 55 % x 10.10 grams/hp-hr

= 0.03 tons (see Table C-2)

C.3.2 Motor Vehicle Operations

Truck and commuting vehicle operations would result in indirect emissions. However, the only activities that are subject to the general conformity determination include vehicle operations within Ft. Belvoir base, for which the Army would have control over. Motor vehicle operations within the base are assumed and summarized as follows:

- Pickup and dump trucks would travel at an average speed of 25 miles per hour (mph) onsite, for a total estimated run time of four hours per working day; and
- Each commuter vehicle would take a 20-minute round trip to commute within the base at an average speed of 25 mph.

Emission factors for motor vehicles were calculated for six month construction period for both dump trucks (heavy duty diesel vehicles) and commuter vehicles (light duty gasoline vehicles) using the USEPA Mobile 5b mobile source emission factor model associated with input parameters provided by the Metropolitan Washington Council of Governments (MWCOC) for an ozone season that is applicable to the Fairfax County area in Virginia (Tangirala, January 11, 2000). These emission factors were then multiplied by the vehicle operational hours to determine motor vehicle emissions (Table C-3).

C.4 Conformity Applicability Determination

Under the general conformity rule, emissions resulting from proposed federal action must be compared to the applicable *de minimis* levels on an annual basis. Total annual emissions were determined for the Proposed Action based on the mobile-source emissions during operation and construction. As defined by the general conformity rule, if the emissions of a criteria pollutant (or its precursors) do not exceed the *de minimis* level, the federal action has minimal air quality impact and therefore the action is determined to conform for the pollutant under study and no further analysis is necessary. Conversely, if the total direct and indirect emissions of a pollutant are above the *de minimis* level, a formal general conformity determination is applicable for that pollutant in order to determine air quality impact significance.

Table C-2

Diesel Equipment Emissions Worksheet

Equipment Type (number)	Total Hours of Operation	Horse power ¹ (HP)	Load Factor ¹ (%)	Emission Factor ¹ (grams/HP-hr)		Emissions (tons)	
				VOC	NO _x	VOC	NO _x
Site Mobilization/Preparation (2 Weeks)							
Backhoe	60	77	55	1.40	10.10	0.00	0.03
Dozer	60	356	59	0.84	9.6	0.01	0.13
Chipping Machine	60	127	78	1.41	11.01	0.01	0.07
Chain Saws	60	56	73	1.41	11.01	0.00	0.03
Parking Lot Construction (2 weeks)							
Roller	60	99	56	0.80	9.30	0.00	0.03
Dozer	60	356	59	0.84	9.6	0.01	0.13
Asphalt Paver	60	91	62	0.60	10.30	0.00	0.04
Building Construction (26 weeks)							
Crane	520	194	43	1.26	10.30	0.06	0.49
Dozer	520	356	59	0.84	9.6	0.10	1.15
Backhoe	520	77	55	1.40	10.10	0.04	0.50
TOTAL EMISSIONS (tons)						0.25	2.62
Source: ¹ Nonroad Engine and Vehicle Emission Study-Report. USEPA, 1991.							

Table C-3

Motor Vehicle Emissions Worksheet

Activity		Hours of Operation	VOC Emission Factor (lbs/hr)	NO _x Emission Factor (lbs/hr)	Emissions (tons)	
					VOC	NO _x
Mobilization Trucks		120	0.096	0.472	0.01	0.03
Total Trucks =	3					
Total Work Weeks* =	2					
Minutes on site per truck per day=	240					
Parking Lot Construction Trucks		120	0.096	0.472	0.01	0.03
Total Trucks =	3					
Total Work Weeks =	2					
Minutes on site per truck per day=	240					
Building Construction Trucks		3,120	0.096	0.472	0.15	0.74
Total Trucks =	6					
Total Work Weeks =	26					
Minutes on site per truck per day=	240					
Total Truck Emissions					0.16	0.79
Mobilization Commuter Vehicles		27	0.037	0.046	0.00	0.00
Total Vehicles =	8					
Total Work Weeks =	2					
Minutes on site round trip =	20					
Parking Lot Construction Commuter Vehicles		67	0.037	0.046	0.00	0.00
Total Vehicles =	20					
Total Work Weeks =	2					
Minutes on site round trip =	20					
Building Construction Commuter Vehicles		1,733	0.037	0.046	0.03	0.04
Total Vehicles =	40					
Total Work Weeks =	26					
Minutes on site round trip =	20					
Total Commuter Vehicle Emissions					0.03	0.04
TOTAL EMISSIONS (tons)					0.20	0.84
Notes: * A work week is five working days						

As shown in Table C-4, the annual emission values for the Proposed Action would not exceed the *de minimis* criteria of 50 tpy (45 mtpy) of VOCs or NO_x; therefore, a formal conformity determination is not required and potential air quality impacts would not be significant. Furthermore, since The *Final State Implementation Plan Revision, Phase I Attainment Plan* (MWCOC, October, 1997) sets forth daily target levels of 362.9 tons per day (tpd) of VOCs and 637.1 tpd of NO_x for the Washington Metropolitan ozone nonattainment area where the Fairfax County area is included, the increase in annual emissions would not make up ten percent or more of the available regional emission inventory for VOCs or NO_x and would not be regionally significant. The Record of Non-Applicability is provided in Appendix D.

Table C-4
Proposed Action
Total Emissions Levels

Activity	Year	Emission Source	Pollutant (tons/year)	
			VOC	NO _x
Construction	2002	Equipment	0.25	2.62
		Motor Vehicles	0.20	0.84
Total Annual Emissions (Year 2002)			0.45	3.46
De Minimis Levels			50	50

APPENDIX D

Record of Non-Applicability

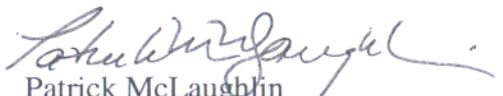
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Department of the Army
US Army Garrison Fort Belvoir
Directorate of Installation Support
9430 Jackson Loop, Suite 107
Fort Belvoir, Virginia 22060-5130

MEMORANDUM FOR RECORD

SUBJECT: Record of Non-Applicability (RONA) for the Relocation of the Army Materiel Command to Fort Belvoir, Virginia

Upon review, it has been determined that the relocation of the Army Materiel Command to Fort Belvoir – including relocation of 1,170 civilian, military and contractor personnel currently working in Alexandria, VA and the construction of a maximum of five temporary buildings providing up to 275,000 gross square feet of space and four parking lots with a total of 702 spaces – does not require a Clean Air Act (CAA) General Conformity Analysis. This action will not result in criteria pollutant emissions above the applicable *de minimis* levels.


Patrick McLaughlin
Division Chief, ENRD

JUN 04 2002